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Indiana's Timber Resource, 1986: An Analysis

John S. Spencer, Jr., Neal P. Kingsley, and Robert V. Mayer

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North Central Forest Experiment Station
Forest Service—U.S. Department of Agriculture
1992 Folwell Avenue
St. Paul, Minnesota 55108
Manuscript approved for publication April 24, 1990
1990

This report includes the most commonly used Forest Inventory and Analysis statistics. However, additional forest resource data can be provided to interested users. Persons requesting additional information that can be provided from the raw inventory data are expected to pay the retrieval costs. These costs range from less than \$100 for a relatively simple request to \$2,000 for a complex retrieval involving the services of a Forest Inventory and Analysis programmer. Requests will be filled so as to minimize the impact on the Forest Inventory and Analysis Work Unit.

Requests for unpublished information may be directed to:

Project Leader
Forest Inventory and Analysis Project
North Central Forest Experiment Station
1992 Folwell Avenue
St. Paul, Minnesota 55108
Phone: (612) 649-5140

Area served: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin.

Requests for unpublished information from the Indiana inventory may also be directed to:

State Forester
Indiana Department of Natural Resources
Division of Forestry
613 State Office Building
Indianapolis, Indiana 46204

FOREWORD

Forest Inventory and Analysis (FIA) is a continuing endeavor as mandated by the Renewable Forest and Rangeland Resources Planning Act of 1974. Prior inventories were mandated by the McSweeney-McNary Forest Research Act of 1928. The objective of FIA is to periodically inventory the Nation's forest land to determine its extent, condition, and volume of timber, growth, and depletions. Up-to-date resource information is essential to frame intelligent forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual States. The North Central Forest Experiment Station is responsible for forest inventory and analysis in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin.

Fieldwork for the Indiana Statewide forest inventory was begun in July 1985 and completed in December 1986. Reports on the two previous inventories of Indiana's timber resource are dated 1950 and 1967.

More accurate survey information was obtained during the 1986 survey than otherwise would have been feasible because of intensified field sampling. Such sampling was made possible by additional funding provided by the Indiana State Legislature through the Division of Forestry, Indiana Department of Natural Resources. The Department also surveyed primary wood-using plants in the State. Data from this survey were used to help estimate the quantity of timber products harvested in the State. Indiana Department of Natural Resources personnel have also assisted in training field personnel, analyzing information obtained from the survey, and preparing this report.

Aerial photos used in the Indiana Forest Inventory were furnished by the Hoosier National Forest and the USDA Agricultural Stabilization and Conservation Service.

The following FIA reports on the 1986 Indiana inventory have been published (see Literature Cited for complete bibliographic information):

Blyth, McGuire, and Smith 1987
Hansen 1987
Leatherberry 1987
Hansen and Golitz 1988
Smith and Golitz 1988

A complete set of Indiana inventory tables (except projections) is found in Smith and Golitz 1988. Spencer, Kingsley, and Mayer 1990 contains only the core tables common to all eastern FIA statistical reports, in addition to projection tables and a few other tables.

HIGHLIGHTS

Area

- Area of forest land rose from 4.0 million acres in 1967 to 4.4 million in 1986.
- Timberland area increased from 3.9 million acres in 1967 to 4.3 million in 1986. Primary reason for the increase is the reversion of wooded pasture and improved pasture to timberland.
- Perry County (153 thousand acres), Harrison County (132 thousand), Brown County (132 thousand), and Orange County (129 thousand), contain the largest areas of timberland in the State.
- The 1986 maple-beech forest type (includes cherry-ash-yellow-poplar type to be comparable with 1967 maple-beech type) covers the largest area in the State (1.6 million acres), displacing oak-hickory, which lead in 1967 with 2.4 million acres, but slipped to second in 1986 with 1.4 million.
- Sawtimber stands accounted for 64 percent of the timberland area in 1986, compared to 52 percent in 1967. The area of seedling-sapling and poletimber stands dropped between inventories.
- Thirty-seven percent of the timberland supports more than 5,000 board feet of timber per acre.
- Fifty-two percent of the stands are less than 50 years old.
- Nonindustrial private owners hold 87 percent of the State's timberland.
- Half of the privately owned timberland (including forest industry timberland) is in holdings of 51 acres or more.
- Two-thirds of the privately owned timberland has been held by the same owner for at least 10 years, and one-third has been held for 20 years or more.
- Seventy-six percent of the timberland grows trees taller than 70 feet at age 50, considered good sites in the Midwest.

- Forest plantations account for 105 thousand acres, 60 percent of which are in the Knobs Unit.

Number of Trees

- The number of growing-stock trees 5.0 inches in diameter and larger increased from 311 to 393 million from 1967 to 1986.

Timber Volume

- Growing-stock volume increased from 3.7 to 5.2 billion cubic feet between 1967 and 1986, a 43-percent rise.
- Sawtimber volume rose from 12.5 to 19.2 billion board feet between inventories, a 54-percent gain.
- Forty-five percent of the growing-stock volume is in the Knobs Survey Unit.
- Oaks account for 30 percent of the growing-stock volume (1.6 billion cubic feet) in 1986, largest of any species group. However, in 1967 oak volume represented 40 percent of the total (1.4 billion).
- The hickories (574 million cubic feet), hard maple (455 million), yellow-poplar (433 million), ash (360 million), and soft maple (244 million) follow the oaks in ranking of growing-stock volume.
- Cull and salvable dead trees represent 893 million cubic feet, in addition to the 5.2 billion cubic feet of growing stock.
- Greatest volume of growing stock is in stands aged 41 to 60 years (32 percent of the total).
- Private owners hold 85 percent of the growing-stock volume.
- Average growing-stock volume per acre was 938 cubic feet in 1967; and 1,215 cubic feet in 1986.
- Sawtimber average volume per acre was 3,212 board feet in 1967, compared with 4,475 board feet in 1986.
- Eighty-three percent of the sawtimber volume is in log grades 3 and 4, poorest of the four grades.

Stand Conditions

- Net annual growth on growing-stock trees rose from 104 million (2.8 percent of inventory) to 154 million cubic feet (2.9 percent of inventory) between 1966 and 1985.
- Net annual growth on sawtimber trees increased from 270 million to 726 million board feet between 1966 and 1985.
- Growing-stock growth per acre averaged 26.6 cubic feet in 1966, compared to 35.8 cubic feet in 1985. Sawtimber growth per acre, which averaged 69.3 board feet in 1966, increased to 169.0 board feet in 1985.
- Annual mortality of growing stock increased from 12 million cubic feet in 1966 to 38 million in 1985.

Timber Use

- Timber removals from growing stock in 1985 amounted to 93 million cubic feet, compared to 65 million cubic feet in 1966, a 43-percent gain.
- Sawtimber removals totaled 462 million board feet in 1985, compared to 345 million in 1966, a 34-percent increase.

- Oak species represented 45 percent of the total growing-stock removals in 1985.

Biomass

- Live tree biomass (trees at least 1 inch in diameter) amounted to 328 million green tons in 1986, an average of 76 tons per acre.
- Fifty-four percent of the biomass (177 million green tons) is in the boles of growing-stock trees.

Projections

- The low removals option projection shows growing-stock inventory growing from 5.2 billion to 7.0 billion cubic feet from 1986 to 2016, a 34-percent increase. Growth exceeds removals throughout the projection period.
- The high removals option projection shows growing-stock inventory increasing from 5.2 billion cubic feet in 1986 to 5.9 billion in 2006, then declining to 5.7 billion in 2016. Removals exceed growth from 2011 to 2016, the end of the projection period.

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Indiana's Timber Resource, 1986: An Analysis

John S. Spencer, Jr., Neal P. Kingsley, and Robert W. Mayer

Indiana's forests are many things to many people. To some the forest provides jobs or forest products, to others it is a place to hunt or camp or watch birds, to still others the forest is a place to convert to shopping centers and parking lots. Whatever its use, the State's forest land, representing 1 out of every 5 acres of land, is an important element in the economic and social well-being of Indiana's citizens. Because the forest is alive, it is constantly changing. This report discusses the present forest situation as well as some of the changes that have occurred since the last forest inventory in 1967.

FOREST AREA GAINS

The area of forest land, which had fallen from 4.1 million acres in 1950 (U.S. Department of Agriculture 1953) to 4.0 million in 1967 (Spencer 1969), rebounded to 4.4 million in 1986.¹ Similarly, the area of timberland (see Definition of Terms in Appendix), which had sagged from 4.1 million acres in 1950 to 3.9 million in 1967, increased to 4.3 million in 1986 (fig. 1). The primary reason for the positive change is the reversion of wooded pasture and improved pasture to timberland. This probably reflects the shift from pasturing cattle to feeding them in feed lots. Also, as consumer demand for red meat has fallen off, the incentive to graze livestock on these lands has fallen off. Another reason for the in-

crease in timberland, particularly in the southeastern part of the State, is the restocking of lands extensively cleared during the late 1800's and then maintained in an open condition throughout the early 1900's by grazing and uncontrolled wildfire. These lands were slow in regaining timberland stocking levels because of the relatively unproductive and erodible soils present.



Figure 1.—The area of timberland in the State increased an average of 21,000 acres per year between 1967 and 1986.

¹ Forest areas for 1950 have been adjusted from those published after the 1950 inventory to conform to 1986 areas because of changes in survey definitions and procedures.

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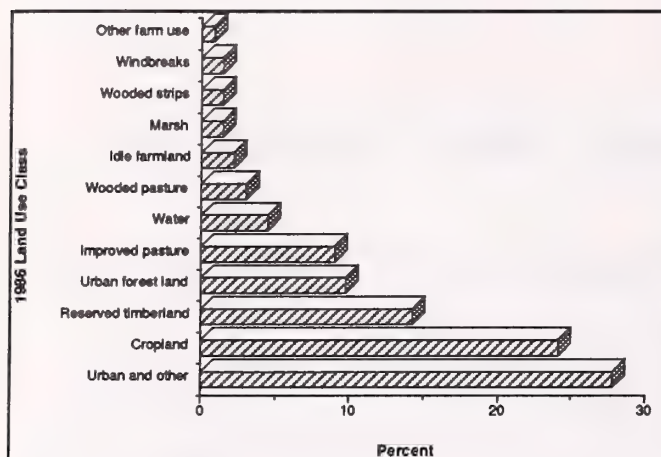


Figure 2.—Percent of plots classed as timberland in 1967 that changed to other land uses by 1986.

SOME TIMBERLAND CHANGED USE BY 1986

A measure of the change among land uses between inventories is possible because a portion of the sample plots established in 1967 were remeasured in 1986. Analysis of these plots shows that 86.7 percent of the plots classed as timberland in 1967 remained as timberland in 1986. The remaining 13.3 percent had changed to another use, primarily urban and other, and cropland, as shown in figure 2.

These losses to the 1967 timberland base were offset by larger gains to timberland, primarily from wooded pasture and improved pasture (fig. 3).

Reserved timberland, primarily parks and natural areas set aside from timber production, increased from 39 thousand to 143 thousand acres between 1967 and 1986. Woodland, defined as forest land that is unproductive and incapable of growing at least 20 cubic feet of wood per acre annually, amounted to 30 thousand acres in 1967, but none was found in 1986.

MORE TIMBERLAND IN KNOBS UNIT

South-central Indiana's Knobs Survey Unit (fig. 4) contains the largest area of timberland, 1.7 million acres (41 percent); followed by the Northern Unit, 1.1 million acres (26 percent); the Lower Wabash Unit, 0.9 million acres (20 percent); and the Upland Flats Unit, 0.6 million acres (13 percent). Five of the six counties with

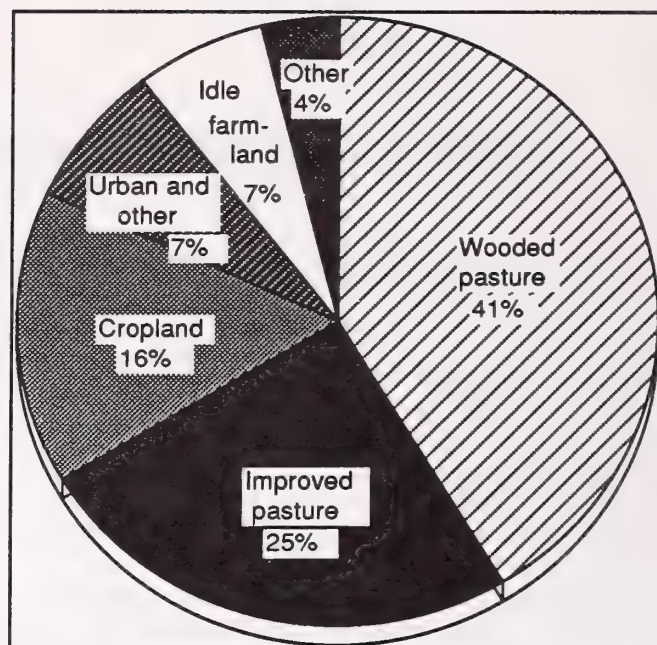


Figure 3.—Percent of area by land use class (1967) that changed to timberland by 1986.

the greatest area of timberland in the State are in the Knobs Unit: Perry (153 thousand acres), Harrison (132 thousand), Brown (132 thousand), Orange (129 thousand), and Lawrence (125 thousand). Martin County (128 thousand) in the Lower Wabash Unit rounds out the six.

MAPLE-BEECH FOREST TYPE MOST EXTENSIVE

In 1967 the oak-hickory forest type² dominated with 2.4 million acres of timberland (61 percent of the State total), and the maple-beech type³ was a distant second with 0.8 million acres (20 percent of the total). By 1986 the situation had reversed and maple-beech covered the largest area with 1.6 million acres (38 percent of the total), and oak-hickory moved to second place with 1.4 million acres (33 percent).

Most of the lost oak-hickory acres converted to maple-beech according to an analysis of plots established in 1967 and remeasured in 1986. Table 1 presents the results of this analysis. Of

²Includes 1986 oak-hickory, chestnut-scarlet oak, and sassafras-persimmon forest type areas.

³Includes 1986 maple-beech and cherry-ash-yellow-poplar forest type areas.

Table 1.--Forest land classification changes in Indiana, 1967-1986
(In thousand acres)

| 1967 land classification | 1967 ^{2/} area | 1986 land classification ^{1/} | | | | | | | | | | | | | | Reserved timber land, woodland and nonforest land |
|---|----------------------------|--|-------------------|-----------------------------|--------------|-----------------|-----------------------------|-------------------------|-------------|----------------|---------------------------|-----------------|-----------------|----------------------------------|-----------------|--|
| | | Timberland - forest type | | | | | | | | | | | | | | |
| | | Jack-red- white pine | Shortleaf pine | Scotch- Virginia pine | Oak- pine | Oak- hickory | Chestnut- scarlet oak | Sassafras- persimmon | Oak- gum | Lowland oak | Elm-ash- soft maple | Cotton- wood | Maple- beech | Cherry-ash- yellow- poplar | Non- stocked | |
| Timberland | | | | | | | | | | | | | | | | |
| Pine | 54.0 | 5.2 | 18.4 | 24.6 | -- | -- | -- | -- | -- | -- | 3.6 | -- | 1.1 | -- | -- | |
| Oak-pine | 46.0 | 1.3 | 1.0 | 5.4 | 15.9 | 1.3 | -- | -- | -- | -- | 7.1 | -- | -- | 7.0 | -- | |
| Oak-hickory ^{3/} | 2,366.7 | 3.1 | -- | 4.3 | 43.5 | 1,214.1 | 38.9 | -- | 25.2 | 22.3 | 171.3 | -- | 296.0 | 278.8 | -- | |
| Oak-gum ^{4/} | 52.2 | -- | -- | -- | -- | -- | -- | -- | 14.1 | 5.4 | 16.9 | -- | -- | -- | -- | |
| Elm-ash-soft maple ^{5/} | 524.3 | 6.5 | -- | 6.3 | 3.1 | 8.3 | -- | -- | -- | -- | 288.8 | 12.4 | 34.6 | 57.6 | 7.0 | |
| Maple-beech ^{6/} | 771.2 | -- | 2.9 | -- | -- | 33.7 | -- | 3.5 | -- | -- | 71.9 | -- | 461.3 | 107.9 | -- | |
| Aspen-birch | 13.1 | 3.6 | -- | 2.9 | -- | -- | -- | -- | -- | -- | 2.4 | -- | -- | -- | -- | |
| Nonstocked | 68.3 | -- | 1.6 | 3.2 | -- | 8.8 | -- | -- | -- | -- | 13.2 | -- | 7.6 | 4.5 | 4.2 | |
| Subtotal | 3,895.8 | 19.7 | 23.9 | 46.7 | 62.5 | 1,266.2 | 38.9 | 3.5 | 39.3 | 27.7 | 575.2 | 12.4 | 800.6 | 455.8 | 11.2 | |
| Reserved timberland, woodland, and nonforest land | 19,106.3 | 35.0 | -- | 23.9 | 41.7 | 104.6 | 7.2 | 16.3 | 12.4 | 3.2 | 255.3 | 6.0 | 184.1 | 193.2 | 29.3 | |
| All land classes | 23,002.1 | 54.7 | 23.9 | 70.6 | 104.2 | 1,370.8 | 46.1 | 19.8 | 51.7 | 30.9 | 830.5 | 18.4 | 984.7 | 649.0 | 40.5 | |
| | | | | | | | | | | | | | | | 18,706.3 | |

^{1/} Read across rows to determine dispersion of 1967 classes to 1986 classes. Read down columns to determine origin of 1986 classes.

^{2/} Total land area adjusted to conform to 1982 National Resource Inventory, Soil Conservation Service.

^{3/} Includes all the 1986 oak-hickory, chestnut-scarlet oak, and sassafras-persimmon types.

^{4/} Includes all the 1986 oak-gum and lowland oak types.

^{5/} Includes all the 1986 elm-ash-soft maple and cottonwood types.

^{6/} Includes all the 1986 maple-beech and cherry-ash-yellow-poplar types.



Figure 5.—*Black cherry and yellow-poplar saplings dominate this former oak-hickory site (foreground) after it was logged.*

the 2.4 million acres in the oak-hickory type in 1967, 1.2 million remained in the oak-hickory type by 1986, 0.6 million converted to the maple-beech and cherry-ash-yellow-poplar types (fig. 5) (the latter two 1986 types comprised the 1967 maple-beech type), 0.3 million converted to other forest types, and the remaining 0.3 million moved into reserved timberland, woodland, or nonforest classes. The 1986 oak-hickory, chestnut-scarlet oak, and sassafras-persimmon types (totaling 1.4 million acres), which make up the 1967 oak-hickory type, include not only the 1.2 million acres that remained oak-hickory between inventories, but also the 0.1 million from non-timberland and the 0.1 million from other forest types.

Three-fourths of the 1967 area of maple-beech remained maple-beech in 1986 (0.6 million acres). In addition, the 0.6 million acres of oak-hickory in 1967 that converted to maple-beech, mentioned above, and 0.4 million acres from non-timberland and other types swelled the 1986 maple-beech area to 1.6 million acres.

To use table 1 to find what became of the 2,366.7 thousand acres of oak-hickory in 1967, simply

read across the oak-hickory row and notice that 3.1 thousand acres are now typed jack-red-white pine, 4.3 thousand are now typed Scotch-Virginia pine, 43.5 thousand are now typed oak-pine, 1,214.1 thousand are now typed oak-hickory, and so on to the end of the row to 269.2 thousand acres now classed as non-timberland. To determine the source of the 1986 oak-hickory type area, read down the oak-hickory column. This shows that 1.3 thousand acres came from the oak-pine type, 1,214.1 thousand remained oak-hickory, 8.3 thousand came from the elm-ash-soft maple type, 33.7 thousand came from the maple-beech type, 8.8 thousand came from formerly nonstocked land, and 104.6 thousand came from non-timberland.

Several factors contribute to the decline of oak-hickory and the rise of maple-beech. First, maple-beech is the climax forest type for most Indiana sites, except dry uplands and moist drainages. The intervention of humans in the form of land clearing, logging, grazing, and fire changed the composition of the forest from a preponderance of maple-beech to a mix of types, especially oak-hickory. The direction of natural plant succession on these lands, however, is

inexorably toward a return to maple-beech. Second, high-grading stands—harvesting only trees of the most desirable species or size—has been practiced widely in Indiana. Most oak-hickory (and other) stands contain some species associated with the maple-beech type; and if only large oaks are removed, the resulting proportion of stocking of this maple-beech component may be high enough to reclassify the residual stand as maple-beech when the stand is reinventoried. Third, when grazing by domestic animals is suspended in oak-hickory (and other) stands, seedlings are better able to become established. Because maple is more shade-tolerant than oaks and because oak reproduction is generally more difficult to obtain than maple, maple is more likely to regenerate these stands than oaks are.

The areas of all other forest types increased between 1967 and 1986. The elm-ash-soft maple type, third largest, increased 62 percent to 0.8 million acres. Pine forest types gained 176 percent to 149 thousand acres, largely the result of tree planting. Oak-pine type area rose 127 percent to 104 thousand acres, and the area of oak-gum increased 58 percent to 83 thousand acres. Nonstocked areas declined 41 percent to 41 thousand acres.

SAWTIMBER STANDS PREDOMINATE

Indiana's timberland was dominated by sawtimber stands in 1967 (52 percent of the total area), and it is even more heavily weighted to sawtimber stands in 1986 (64 percent), as shown in figure 6. The 36-percent gain in area of sawtimber stands reflects the waves of trees growing out of the poletimber size-class into sawtimber size between inventories. The Upland Flats Survey Unit contained a smaller proportion of sawtimber stands than other units—one half of its timberland, compared to two-thirds for the other units. Forest types with higher than average areas of sawtimber stands include the chestnut-scarlet oak type (100 percent of timberland area), lowland oak type (82 percent), oak-hickory (71 percent), and maple-beech (70 percent).

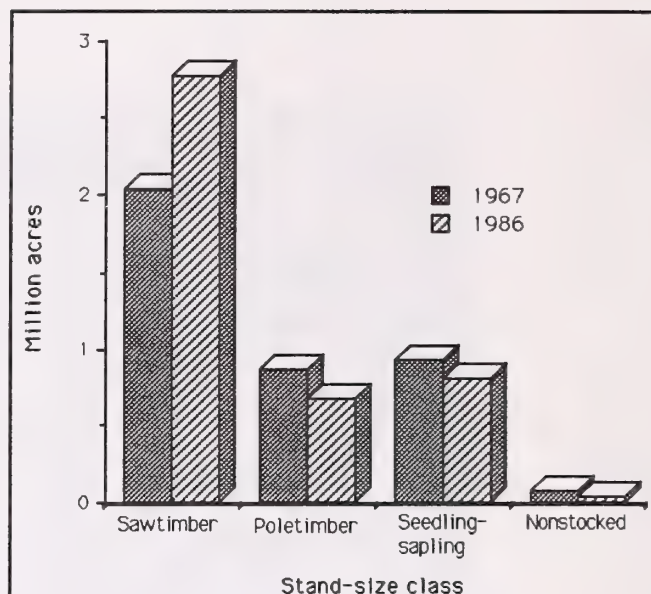


Figure 6.—Area of timberland by stand-size class, Indiana, 1967 and 1986.

The area of poletimber stands dropped 22 percent and the area of seedling-sapling stands declined 12 percent between inventories. Nonstocked area fell by 41 percent. The shortleaf pine type exhibits the greatest proportion of its timberland area in poletimber stands (61 percent), compared with the average for all types of 16 percent. The sassafras-persimmon type (79 percent) and Scotch-Virginia pine type (45 percent) display the largest proportions in sapling and seedling stands, compared with an average of 19 percent.

Thirty-seven percent of the State's timberland presently supports more than 5,000 board feet of timber per acre, as shown in the following tabulation. The Knobs Unit contains more of these high-volume stands than any other Unit (47 percent).

| Stand volume class (Board feet) | Area (Thousand acres) | Percent |
|------------------------------------|--------------------------|---------|
| Less than 1,500 | 1,348.4 | 31 |
| 1,500 to 5,000 | 1,363.5 | 32 |
| 5,000+ | 1,583.9 | 37 |
| Total | 4,295.8 | 100 |

FIFTY-TWO PERCENT OF STANDS LESS THAN 50 YEARS OLD

The distribution of timberland by 10-year age classes is fairly even up to the 90-year class (fig. 7). Stands older than 90 years are much less frequent. More than half of the timberland area is in stands less than 51 years old.

Age class distribution of individual forest types is far more erratic. The entire jack-red-white pine type is aged 50 years or younger, as is 93 percent of the Scotch-Virginia pine type and 90 percent of the shortleaf pine type. Types consisting of long-lived species, understandably, contain greater proportions in older age classes. For example, 97 percent of the chestnut-scarlet oak type is 51 years or older, and 64 percent of it is 81 years or older. Eighty-two percent of the lowland oak type and 66 percent of the oak-hickory type is at least 51 years old.

If a rotation age—the planned number of years between regeneration of a stand and its final cutting for a specific product—is assumed for a forest type, the area in age classes older than rotation age provides an estimate of the area of overmature stands. These stands can be expected to decline in growth and vigor, but not necessarily in value. Assuming average rotation ages of 100 and 90 years, respectively, for the oak-hickory and maple-beech types, areas of

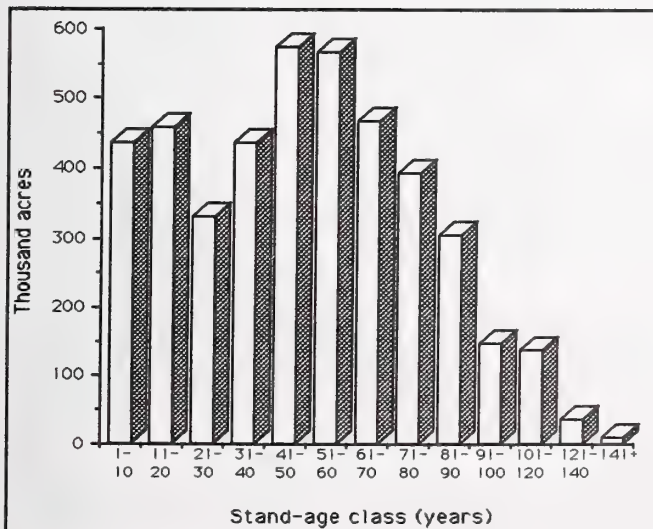


Figure 7.—Area of timberland by stand-age class, Indiana, 1986.

overmature stands amounting to 105 and 92 thousand acres, respectively, are suggested (5 percent of the timberland area).

NONINDUSTRIAL OWNERS DOMINATE

Farmers own 1.7 million acres of timberland (40 percent of the total), and other private individuals and corporations (classed as miscellaneous private owners) account for another 2.0 million acres (47 percent), as shown in figure 8. Together, these nonindustrial private forest (NIPF) owners accounted for the bulk of Indiana's timberland in 1986, just as they did in 1967. However, in 1967 farmers owned 68 percent of the timberland and miscellaneous private owners accounted for 22 percent. Apparently, many farmers sold timberland between inventories. Also, part of the reason for the different results from the two inventories is a change in the definition of farmer between 1967 and 1986 (based on different values generated from the sale of agricultural products) that shifted some of the area previously classed as farmer owned into the miscellaneous private class.

Nonindustrial private owners account for 74 percent of the pine type area, although they hold

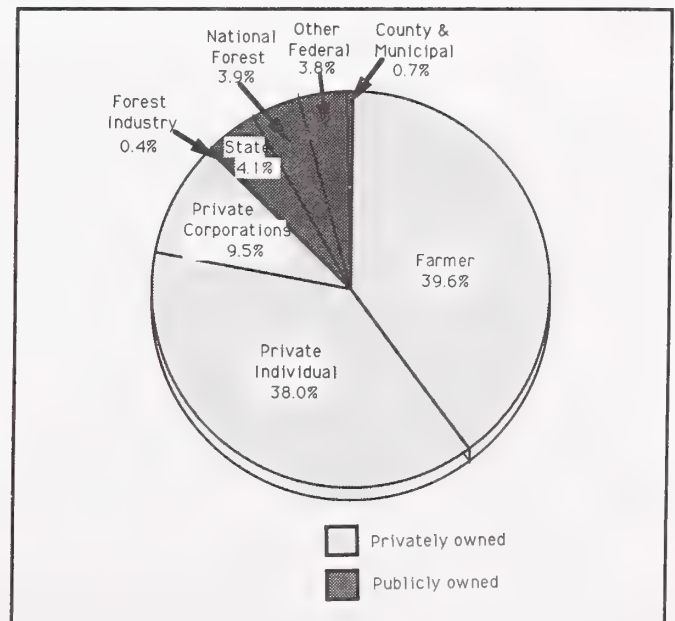


Figure 8.—Area of timberland by ownership class, Indiana, 1986.

87 percent of the timberland area. The Hoosier National Forest contains 18 percent of the pine forest type area, although the Forest accounts for only 4 percent of the total timberland. This reflects the high level of pine planting done in the past on National Forest land. NIPF owners also account for a proportionally smaller area of the oak-hickory type (79 percent) than other owners. But NIPF owners control larger amounts of the maple-beech (92 percent), elm-ash-soft maple (93 percent), and cherry-ash-yellow-poplar forest types (92 percent) than their timberland share.

Half of the privately owned timberland (including forest industry owned timberland) is in holdings of 51 acres or more. Another one-fourth is in holdings of 21 to 50 acres. These areas represent the total owned by an individual, and may include noncontiguous tracts:

| Size of holding | Area of privately owned timberland | |
|-----------------|------------------------------------|-----------|
| (Acres) | (Thousand acres) | (Percent) |
| 1-4 | 227.2 | 6 |
| 5-10 | 212.9 | 6 |
| 11-20 | 500.1 | 13 |
| 21-50 | 957.0 | 25 |
| 51-100 | 845.3 | 23 |
| 101-500 | 786.8 | 21 |
| 501-2,500 | 127.1 | 3 |
| 2,501-5,000 | 26.3 | 1 |
| 5,001+ | 78.2 | 2 |
| Total | 3,760.9 | 100 |

Two-thirds of the privately owned timberland has been held by the same owner for at least 10 years, and one-third has been held for 20 years or more, as shown in the following tabulation:

| Owner tenure | Area of privately owned timberland | |
|--------------|------------------------------------|-----------|
| (Years) | (Thousand acres) | (Percent) |
| 1-4 | 584.1 | 16 |
| 5-9 | 793.4 | 21 |
| 10-19 | 1,145.9 | 30 |
| 20+ | 1,237.5 | 33 |
| Total | 3,760.9 | 100 |

AVERAGE SITE INDEX IS 81 FEET

Site index provides a perspective of forest site quality by classing timberland in terms of height

growth made by dominant and codominant trees of the selected species at a specified age (usually 50 years). Generally, the better sites grow taller trees. However, site index values differ by species or forest type. A site index in the high range for one type may be considered average for another type. Therefore, if a site is converted from one forest type to another, the site index for the new type may be much different from that of the old type.

Sites in Indiana are generally good. Forest land in the Midwest can generally be described as follows:

| Site Index class | Description |
|------------------|--------------|
| 55 or less | Poor site |
| 56 to 70 | Average site |
| More than 70 | Good site |

Seventy-six percent of Indiana's timberland (3.3 million acres) grows trees taller than 70 feet at age 50, and 56 percent of the timberland (2.4 million acres) grows trees taller than 80 feet (fig. 9).

The weighted average site index for all forest types in Indiana is 80.8 feet. The highest weighted average index is the 93.1 feet for the jack-red-white pine type, followed by cherry-ash-yellow-poplar (85.7 feet), maple-beech (84.6 feet),

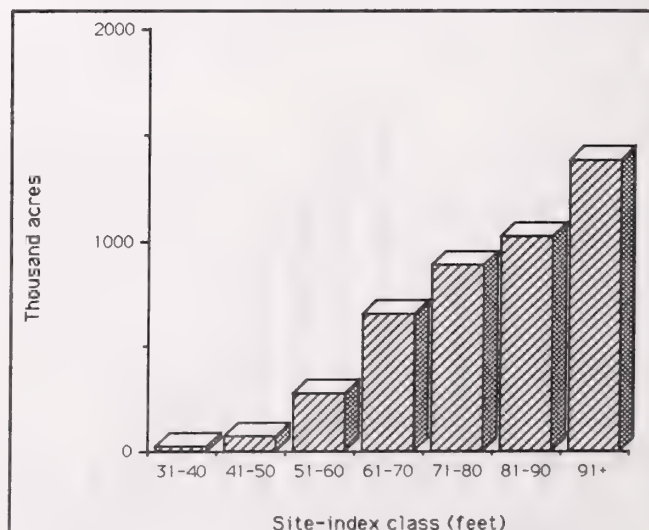


Figure 9.—Area of timberland by site-index class, Indiana, 1986.

shortleaf pine (82.7 feet), and elm-ash-soft maple (82.2 feet). The lowest average site index is the 70.6 feet for the chestnut-scarlet oak type.

TWO PERCENT OF TIMBERLAND IN PLANTATIONS

An estimated 105 thousand acres are in forest plantations, 60 percent of which are in the Knobs Unit. Ninety percent of the plantations grow pines:

| Forest type | Area of plantation (Thousand acres) |
|--------------------------|--|
| Jack-red-white pine | 40.2 |
| Scotch-Virginia pine | 34.2 |
| Shortleaf pine | 20.7 |
| Elm-ash-soft maple | 3.7 |
| Cherry-ash-yellow-poplar | 3.7 |
| Oak-gum | 1.5 |
| Lowland oak | 1.2 |
| Total | 105.2 |

These estimates of plantation areas are probably conservative, especially for hardwood types, because young hardwoods may be growing with or be overtopped by other hardwoods and may not be noticed by field crews.

Thirty-eight percent of the plantations are 31 to 40 years old, and were planted between 1946 and 1955. Nearly equal amounts have been planted in each of the three decades since.

NUMBER OF GROWING-STOCK TREES INCREASED

The total number of growing-stock trees 5.0 inches in diameter and larger in the State rose from 311 to 393 million from 1967 to 1986, a 26-percent increase. The number of trees in 1986 was greater than in 1967 for every diameter class (fig. 10).

All species, except the oaks, increased in number of trees. As mentioned earlier, the area of oak-hickory type declined substantially between inventories primarily due to natural plant succession and the "high grading" of stands during logging. This area loss is also reflected in a loss of trees. The white oak group (both select and

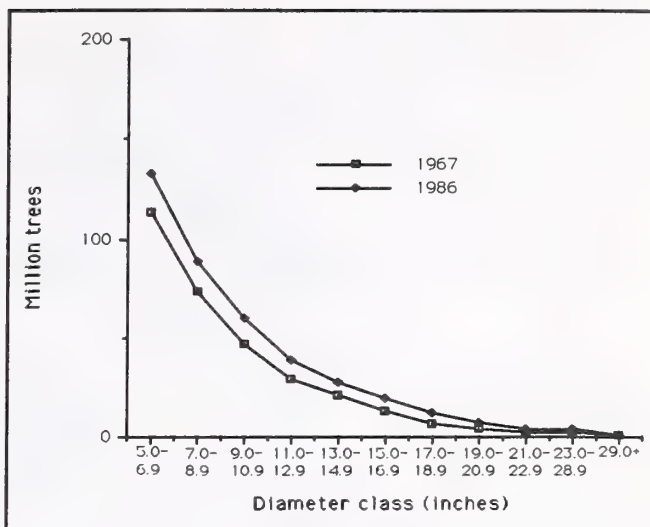


Figure 10.—Number of growing-stock trees on timberland by diameter class, Indiana, 1967 and 1986.

other white oaks) was especially hard hit. Each diameter class, from the 6-inch to the 14-inch class, lost trees. In the 6-inch class (5.0 to 6.9 inches), the loss was 54 percent, but in the 14-inch class, the decline was only 4 percent. The red oak group showed declines in the 6-inch class (30-percent loss) to the 12-inch class (15-percent loss).

If Indiana's important oak resource is to be maintained or improved, policies designed to bring these lands under more intensive management will need to be implemented. Financial incentives to encourage private landowners to seek the advice of professional foresters before harvesting their timber or performing other forest practices would help turn the situation around. The Forest Classification Act, a State law passed in 1921, permits forest land enrolled in the program to be taxed at an assessed value of \$1 per acre, a significant tax-savings and an incentive for landowners to maintain land in forest cover. The Division of Forestry prepares a detailed forest management plan on enrolled lands and revises the plan every 10 years. Although landowners are not required to follow the management plan, most owners perform at least some of the recommended practices.

TIMBER VOLUME GAINS

The volume of growing stock in the State increased from 3.7 to 5.2 billion cubic feet between 1967 and 1986, a 43-percent gain. Sawtimber volume rose even faster, from 12.5 to 19.2 billion board feet⁴, a 54-percent increase. These sharp increases came during a time when the area of timberland in Indiana expanded from 3.9 to 4.3 million acres, a 10-percent gain. However, the increases in timber volumes are more a result of larger average tree size in 1986 than of the added acres of timberland. Many of the added acres were previously wooded pasture or marginal farmland that reverted to timberland, but that contained only a few volume-producing trees. On the other hand, the area of sawtimber stands increased 36 percent (734 thousand acres) between inventories as many poletimber trees grew into sawtimber size.

ALMOST HALF OF VOLUME IN KNOBS UNIT

Forty-five percent of the growing-stock volume (2.3 billion cubic feet) is in the Knobs Survey Unit in the south-central part of the State (fig. 11). The Northern Survey Unit grows 24 percent of the State's growing-stock volume (1.2 billion cubic feet), the Lower Wabash Survey Unit grows 21 percent (1.1 billion), and the Upland Flats Survey Unit contains the remaining 10 percent (0.5 billion). The proportions of sawtimber in each Survey Unit are identical to the above proportions for growing stock.

Perry County (213 million cubic feet) and Brown County (190 million), both in the Knobs Survey Unit, lead all other counties in volume of growing stock and sawtimber.

MOST TIMBER VOLUME IN HARDWOODS, ESPECIALLY OAKS

Hardwoods dominate Indiana's forests, although slightly less in 1986 than in 1967. Hardwood growing-stock volume in 1967 (3.6 billion cubic feet) amounted to nearly 98 percent of the total, but in 1986 the hardwood volume of 5.0 billion cubic feet was 96 percent of the total. Although softwoods are only a minor element in the State,

their growing-stock volume increased 142 percent between inventories, compared with an increase of 41 percent for hardwoods. These rapid softwood gains stem, in part, from plantations that grew to poletimber size (trees below poletimber size do not contribute to volume) from 1967 to 1986, evidenced by the tenfold increase in white pine volume, the more than quadrupling of the red pine volume, and the doubling of the volume of other yellow pines.

The volume of oaks amounts to 30 percent of the growing-stock total in 1986 (1.6 billion cubic feet), largest of any species group. However, the 1.4 billion cubic feet of oaks in 1967 represented 40 percent of that year's total. Therefore, the oaks no longer occupy as commanding a position in the State's supply of timber, and are not keeping up with the expansion of other species' volumes (fig. 12). Although all groups of oaks, except other white oaks, increased in volume between inventories, the rate of increase for all oaks was only 10 percent compared with an average increase of 41 percent for all hardwood species. The 39-percent loss between inventories in area of the oak-hickory forest type and the high demand for oak forest products are the major reasons for this slower rate of increase. As mentioned earlier, the area of the oak-hickory type lost 930 thousand acres between 1967 and 1986. At the same time, area of the maple-beech type (includes 1986 cherry-ash-yellow-poplar type) increased 863 thousand acres.

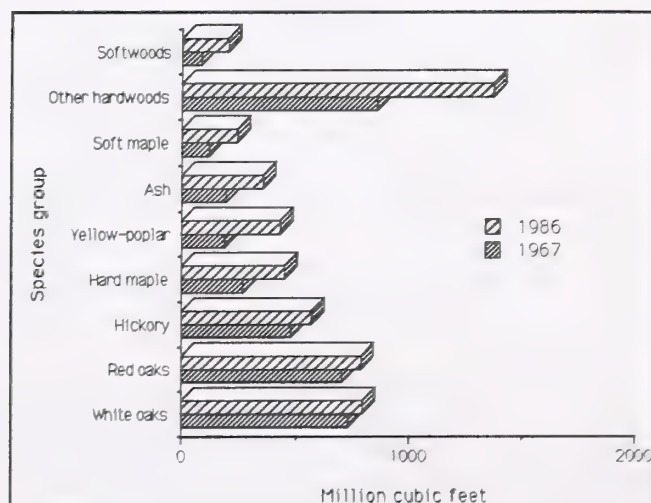


Figure 12.—Volume of growing stock by species group, Indiana, 1967 and 1986.

⁴International 1/4-inch rule.

The hickories, with 574 million cubic feet, contain the second largest volume among species groups, followed by hard maple (455 million), yellow-poplar (433 million), ash (360 million), and soft maple (244 million).

The change in the ranking of the volume of species between inventories tells something of the dynamic forces that interplay in the forest. The oaks and the hickories were first and second, respectively, in both inventories. Hard maple was third on both occasions, but its volume gained a substantial 65 percent by 1986, fueled by an increase in area of the maple-beech and cherry-ash-yellow-poplar forest types. Ash had the fourth largest volume in 1967, but was displaced by yellow-poplar in 1986, also partly due to the increase in the latter forest types, as well as the exceptionally fast growth rate of yellow-poplar—4.6 percent of inventory, third among species behind sweetgum (5.2 percent) and soft maple (5.0 percent). The fifth largest volume in 1967 belonged to yellow-poplar, but in 1986 ash was ranked fifth. Sycamore was sixth in 1967, but soft maple took its place in 1986. Tolerant of shade and fast-growing, soft maple is often able to benefit from plant succession and capture sites previously dominated by other species, especially if it is in the understory of disturbed stands.

VOLUME OF ALL CLASSES OF TIMBER IS 6.1 BILLION CUBIC FEET

Cull and salvable dead trees add 893 million cubic feet to the growing-stock total of 5.2 billion cubic feet (table 2). Cull and salvable dead tree volume amounts to 14.6 percent of the total in Indiana, suggesting that yields can be increased without affecting growing-stock levels by harvesting more of these trees.

Table 2.—*Net volume of timber on timberland by class of timber and softwoods and hardwoods, Indiana, 1986*
(In million cubic feet)

| Class of timber | All species | Softwoods | Hardwoods |
|-----------------------|-------------|-----------|-----------|
| Growing stock | | | |
| Pole/timber | 1,453 | 87 | 1,366 |
| Sawtimber | 3,765 | 114 | 3,651 |
| Total growing stock | 5,218 | 201 | 5,017 |
| Rough and rotten cull | 649 | 10 | 639 |
| Short-log cull | 162 | 2 | 160 |
| Salvable dead | 82 | 5 | 77 |
| All classes | 6,111 | 218 | 5,893 |

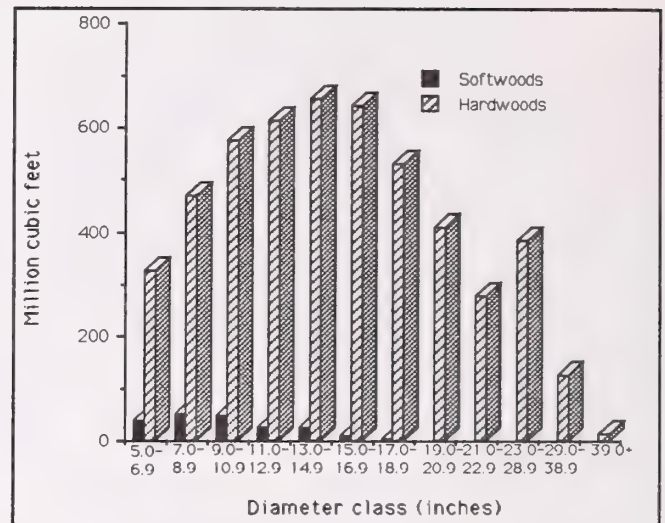


Figure 13.—*Volume of growing stock on timberland by softwoods and hardwoods, and diameter class, Indiana, 1986.*

Growing-stock volume by diameter class is greatest in the 14-inch class with volumes dropping off about equally in either direction (fig. 13). Softwood volume is concentrated much more in the smaller diameter classes—81 percent is in trees 12 inches in diameter or less, compared with 39 percent for hardwoods. The large volume of young softwoods in plantations accounts for much of this difference.

Species with the largest volumes in the higher diameters (24 inches and greater) include select red and white oaks, other red oaks, yellow-poplar, sycamore, cottonwood, and soft maple.

Individual species are scattered widely throughout forest types. The volumes of some species are high in some forest types with which they are not primarily associated. For example, 47 percent of the softwood volume is found in hardwood forest types. Volume in the oak-hickory type is largest, with 36 percent of the growing-stock total. However, one-third of the oak volume is found in other types—primarily the maple-beech type (13 percent) and the cherry-ash-yellow-poplar type (6 percent). And 21 percent of the hickory volume and 29 percent of the elm volume are in the maple-beech type. The largest share of the black walnut volume is in the cherry-ash-yellow-poplar type (34 percent), and the greatest black cherry volume is in the maple-beech type (36 percent).

LARGEST VOLUMES IN STANDS AGED 41 TO 60 YEARS

Volume of growing stock by 10-year stand-age classes is greatest in the 41- to 50-year and the 51- to 60-year classes, representing 32 percent of the total (fig. 14). The area of timberland supporting stands aged 41 to 60 years is also greatest, although it amounts to only 27 percent of the total area of timberland. Stands 41 to 60 years old originated between 1926 and 1945, a time when the public's interest in the protection and management of forest land was awakening.

Timber in stands more than 90 years old makes up 10 percent of the growing-stock volume (11 percent of the sawtimber volume). Most of this volume is in long-lived oak-hickory and maple-beech stands. No softwood stands are as old as 90 years. Older stands are important for a number of reasons: they provide ecological niches for some plant and animal species, they permit biological diversity, they furnish an increasingly rare esthetic and recreational opportunity, and they supply roundwood forest products of large size and high quality. In 1967 there were 567 thousand acres of these older stands in the State, but by 1986 there were only 331 thousand acres—a decline of 42 percent.

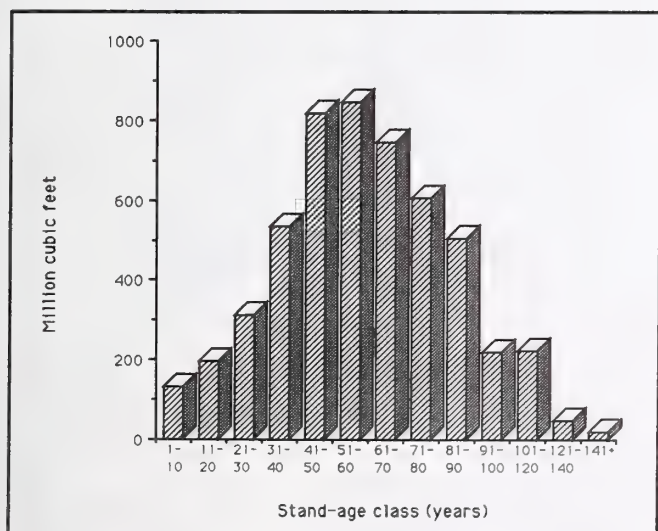


Figure 14.—Volume of growing stock by stand-age class, Indiana, 1986.

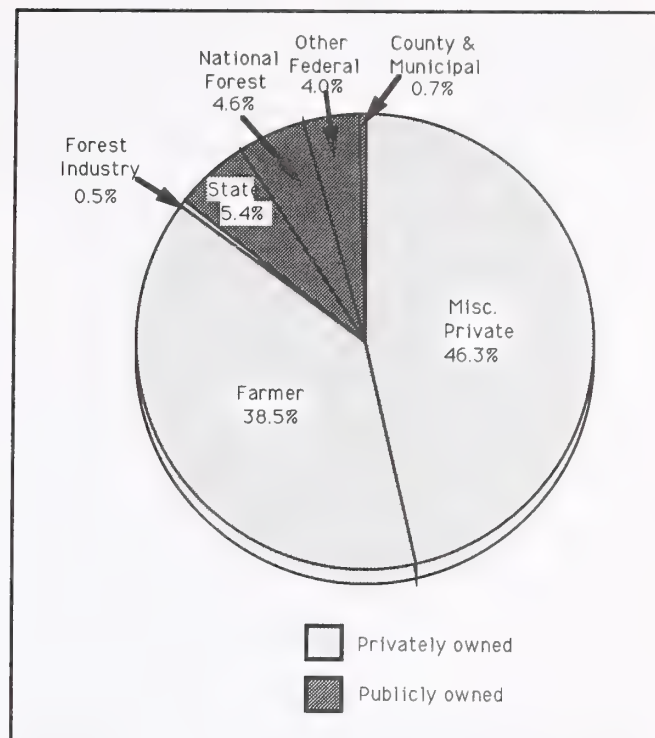


Figure 15.—Percent of growing-stock volume on timberland by owner class, Indiana, 1986.

EIGHTY-FIVE PERCENT OF GROWING-STOCK VOLUME IS PRIVATELY OWNED

Miscellaneous private owners hold 46 percent of the State's growing-stock volume (2.4 billion cubic feet), farmers own an additional 39 percent (2.0 billion cubic feet), and forest industry owns 0.5 percent (26 million cubic feet). Added together, private owners account for 85 percent of the volume or 4.5 billion cubic feet (fig. 15). In 1967 they accounted for 88 percent.

Private owners hold somewhat less of the softwood inventory (80 percent) than of the hardwood inventory (85 percent), probably reflecting a greater tendency to plant softwood trees on public land.

The bulk of the growing-stock volume (82 percent) is in sawtimber stands. Even more of the sawtimber volume (89 percent) is in sawtimber stands. Poletimber stands support 12 percent of the growing-stock volume (7 percent of the sawtimber volume), and sapling and seedling stands grow 6 percent of the growing-stock volume (4 percent of the sawtimber volume). Nonstocked areas provide less than 1 percent of the timber volume.

Average volume per acre of growing stock in 1986 is 1,215 cubic feet, up from 938 cubic feet in 1967. In Indiana, highest average volumes per acre are on State-owned timberland—1,593 cubic feet—followed by National Forest and forest industry land, each with 1,439 cubic feet. Lowest average volumes per acre are on farmer and miscellaneous private timberland, 1,178 and 1,186 cubic feet, respectively. Forest types with the highest average volumes per acre are chestnut-scarlet oak (1,812 cubic feet), cottonwood (1,530), shortleaf pine (1,400), and oak-hickory (1,373). Lowest per acre volumes are in the sassafras-persimmon (328 cubic feet) and oak-pine (893) forest types.

Sawtimber average volume per acre is 4,475 board feet, compared to 3,212 board feet in 1967.

QUALITY OF SAWTIMBER IS LOW

We estimated sawtimber quality by two methods: (1) estimating the grade of the butt log of each sampled sawtimber tree and applying that grade to the entire volume of the tree, and (2) estimating the grade of each log in the tree of a smaller sample of felled trees from a utilization study and applying the results to the total sawtimber inventory. These methods are discussed more completely in the Tree Quality section of the Appendix.

Three-quarters of the volume in sawtimber-sized trees is in the two poorest butt log grades of the four grades used. Seventeen percent of the volume is in butt log grade 2, and the remaining 8 percent is in grade 1. Small diameter trees do not meet the specifications for grades 1 and 2, and are automatically classed in the poorer butt log grades. Because most of the softwood sawtimber volume is in the smaller diameters, most of the softwood volume is in the poorer grades. Only 4 percent of the softwood sawtimber volume is in butt log grades 1 and 2, and 96 percent is in grade 3 and tie and timber. Hardwoods, with generally larger diameters, contain more volume in the better grades. Twenty-six percent of the hardwood sawtimber volume is in butt log grades 1 and 2, and 74 percent is in grade 3 and tie and timber. Species with the highest proportions of their sawtimber volumes

in butt log grades 1 and 2 are sycamore (50 percent), select white oak (43 percent), ash (42 percent), cottonwood (41), and black walnut (41).

Because, in most cases, the grade of the butt log of a tree is better than the grade of upper logs, butt log grade classification tends to overestimate the volume in high quality trees. This is borne out by the estimate of log grade for all saw logs in all sawtimber trees, resulting from the utilization study mentioned above, which shows that 83 percent of the sawtimber volume is in log grades 3 and 4, poorest of the four grades (fig. 16). This compares with 75 percent of the sawtimber volume in butt log 3 and tie and timber, mentioned earlier. Thirteen percent is in log grade 2, and 4 percent is in grade 1. The higher the log grade, the greater the proportion of volume in the larger diameter classes. For example, the biggest share of volume in log grade 1 is in the 20- to 22-inch diameter classes (37 percent), but the largest proportion in grade 2 is in the 16- to 18-inch diameter classes (36 percent), and the greatest share in grades 3 and 4 is in the 10- to 14-inch diameter classes (41 percent). This is expected because larger diameter trees usually produce higher quality logs.

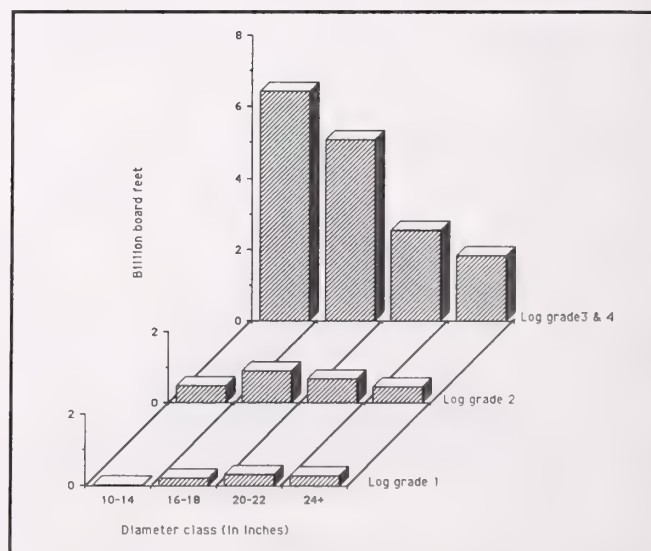


Figure 16.—Net volume of sawtimber on timberland by log grade and diameter class, Indiana, 1986.

VOLUME OF GROWTH GAINS

Since 1966, net annual growth on growing stock has increased from 104 to 154 million cubic feet, a gain of 48 percent. This reverses the trend between 1950 and 1966 when the volume of growth declined. There was virtually no difference in the rate of increase for softwoods (49 percent) or hardwoods (48 percent). Net annual growth of sawtimber increased from 270 to 726 million board feet between 1966 and 1985, a gain of 169 percent.

The growing-stock growth rate (growth as a percent of inventory) remained almost constant between inventories. The rate was 2.8 percent in 1966 and 2.9 percent in 1985. On a per acre basis, growing-stock growth averaged 26.6 cubic feet in 1966, but rose to 35.8 cubic feet in 1985, the result of the increasing inventory volumes per acre mentioned earlier. Sawtimber growth rates increased from 2.2 percent in 1966 to 3.8 percent in 1985; and sawtimber growth per acre, which averaged 69.3 board feet in 1966, jumped to 169.0 in 1985. These latter increases reflect the increasing average diameter class.

Growth rates differed little among Survey Units—rates ranged from 3.1 percent in the Upland Flats Unit to 2.9 percent in the Northern and Knobs Units. Miscellaneous private timberland exhibits the highest growing-stock growth rate (3.1 percent), followed by farmer-owned land (3.0 percent), miscellaneous federal land (2.8 percent), county and municipal land (2.6 percent), State land (2.5 percent), forest industry land (2.0 percent), and National Forest land (1.8 percent). Farmer and miscellaneous timberland probably receives the least forest management among the various owner classes, but it includes a slightly higher proportion of faster growing sites (as estimated from site class data) than other owner classes and, therefore, generates somewhat higher growth rates.

The growth rate for softwood growing stock (3.3 percent) is slightly higher than the hardwood rate (2.9 percent). Softwoods are usually much

younger than hardwoods in the State—nearly two-thirds of the area of softwood forest types is in plantations, and 89 percent of the area in those softwood plantations is in stands 40 years old or younger. Young trees are usually the fastest growing, and softwood species in general grow faster than long-lived hardwoods.

POTENTIAL GROWTH ESTIMATED

The potential net annual growth in Indiana is estimated to be 333 million cubic feet, or 77 cubic feet per acre, about twice as high as the current 36 cubic feet per acre. We estimated the productive potential of timberland in the State using site class data collected during the latest inventory. Site class values represent the annual volume of growth per acre of fully stocked natural stands at culmination of mean annual increment⁵. We multiplied the area in each site class by the midpoint of the range of growth in that class to estimate potential growth in the State. This method yields a potential growth that is somewhat higher than expected because most stands in the State are not natural (unmanaged or uncut). Spurr and Vaux (1976) discounted an estimate of potential growth for the Nation by 10 percent to adjust for the differences between actual stand conditions and the fully stocked, natural conditions implicit in use of site class.

Table 3 shows the method used to estimate potential growth. The unadjusted potential growth of 370 million cubic feet in the table was discounted by 10 percent, as suggested by Spurr and Vaux, resulting in the adjusted 333 million cubic feet mentioned above.

Potential growth can be pushed even higher if intensive forest management, such as thinning, planting of genetically superior trees, crop tree release, vine removal, and fertilization, are conducted over wide areas.

⁵ *Culmination of mean annual increment is the point at which a curve plotting current annual increment crosses a curve plotting mean annual increment.*

Table 3.—*Estimation of potential net annual growth on timberland, Indiana, 1986*

| Site class (foot ³ /acre/ year) | Area of timberland | Potential ¹ net growth per acre | Unadjusted total potential growth | Adjusted total potential growth (discounted by 10 percent) |
|--|-----------------------|---|---------------------------------------|---|
| | <i>Thousand acres</i> | <i>Feet³/acre/year</i> | <i>Thousand feet³/year</i> | |
| 164-120 | 695.7 | 142.0 | 98,789.4 | 88,910.5 |
| 119-85 | 1,496.5 | 102.0 | 152,643.0 | 137,378.7 |
| 84-50 | 1,400.3 | 67.0 | 93,820.1 | 84,438.1 |
| 49-20 | 703.3 | 34.5 | 24,263.8 | 21,837.4 |
| | <u>4,295.8</u> | | <u>369,516.3</u> | <u>332,564.7</u> |

¹Midpoint of site class interval.

MORTALITY TRIPLES BETWEEN SURVEYS

Annual mortality of growing stock amounted to 38 million cubic feet in 1985, compared to 12 million cubic feet in 1966. Some of this increase is probably due to the improved method of estimating mortality we used during the 1986 inventory. The method involved observation of trees on two occasions (1967 and 1986) on remeasured plots, rather than on just one occasion (1967). However, some of the mortality increase is real because stands matured and more trees died. The mortality rate is 0.7 percent of inventory, up from 0.3 percent in 1966. The softwood mortality rate (1.1 percent) is much higher than the hardwood rate (0.7 percent).

Eighty-six percent of the mortality volume was due to "unknown and other" causes because it was impossible for the field crews to identify the primary cause of death. Crews must be confident that the cause of death they assign a dead tree is the primary agent that caused the tree to die, and not a secondary or tertiary agent. Of the 5.2 million cubic feet of mortality for which field crews were able to assign a cause, weather (primarily wind, ice, and snow storms) accounted for the largest proportion (45 percent), followed by disease (38 percent) and suppression (10 percent).

Sawtimber mortality in 1985 was 101 million board feet, 0.5 percent of inventory, up from 37 million in 1966 (0.3 percent of inventory).

TIMBER REMOVALS GAIN BY 43 PERCENT

Annual timber removals from growing stock in 1985 amounted to 93 million cubic feet, a 43-percent increase from the 1966 removals of 65 million cubic feet. The volume of softwood removals, which only amounted to 0.3 million cubic feet, declined between surveys, but hardwood removals increased. The 1985 growing-stock removals rate was 1.8 percent of inventory.

Sawtimber removals for 1985 totaled 462 million board feet, compared to 345 million board feet in 1966 (fig. 17). Softwood sawtimber removals increased by 6 percent, although they accounted for only 1 million board feet; and hardwood removals gained 34 percent from the 1966 level. The removals rate for sawtimber in 1985 was 2.4 percent of inventory, somewhat higher than the growing-stock rate. This reflects the predominant saw-log market and the much smaller market for smaller trees.

Removals of oak species represented 45 percent of total growing-stock removals in 1985. Oak removals in 1985 (42 million cubic feet) were 70 percent greater than in 1966 (25 million) as demand for oak—for flooring, cabinetry, and furniture—increased. The volume of removals of each of the oak species groups was greater in 1985 than in 1966. The select red oak and other red oak groups were harvested most intensely—removals rates of 3.4 percent of inventory for each. Other species with above average removals

rates were beech (2.4 percent), ash (2.2 percent), other white oak (2.2 percent), and yellow-poplar (2.2 percent).

BIOMASS ESTIMATED

The aboveground weight (biomass) of live trees and shrubs in the State was estimated as part of the inventory. This kind of information is important to those who need to know more about the total volume (including limbs, leaves, and bark) of vegetation on the ground because of our changing perception of the forest. Those concerned with wildlife habitat, for example, need to know something of the diversity and amount of plant species used by wildlife in the State. And as technology permits new ways of using wood fiber, a measure of the weight of wood on the ground may provide practical insights into available raw material.



Figure 17.—Sawtimber removals in 1985 were 34 percent higher than in 1966.

Total biomass of all live trees at least 1 inch d.b.h. on timberland in the State was 328 million green tons in 1986, an average of 76 tons per acre. The oak-hickory forest type contains about one-third of the biomass, 116 million green tons (84 tons per acre), followed by the maple-beech type with 79 million tons (80 tons per acre), the elm-ash-soft maple type with 57 million tons (69 tons per acre), and the cherry-ash-yellow-poplar type with 48 million tons (73 tons per acre).

Fifty-four percent of the biomass is in the boles of growing-stock trees. Tops and limbs of growing-stock trees account for 15 percent, as shown in the following tabulation:

| Biomass component | Weight (Million green tons) | Percent |
|-------------------------|--------------------------------|----------|
| Growing-stock trees | | |
| Stumps | 12.8 | 4 |
| Boles | 176.7 | 54 |
| Tops and limbs | 51.1 | 15 |
| Cull trees | | |
| Stumps | 3.1 | 1 |
| Boles | 43.0 | 13 |
| Tops and limbs | 11.8 | 4 |
| Live 1- to 5-inch trees | <u>29.1</u> | <u>9</u> |
| Total | 327.6 | 100 |

The combination oak-gum and lowland oak forest type contains the largest total shrub biomass (5,822 pounds per acre green weight), followed by the cherry-ash-yellow-poplar type (4,461 pounds per acre), and the combination of all pine types (3,219 pounds per acre).

Among the tall shrubs, which include live trees less than 1 inch d.b.h., prickly ash accounts for the largest average biomass (283 pounds per acre green weight)⁶. Nearly all the prickly ash biomass is in the cherry-ash-yellow-poplar forest type. Other tall shrubs with large amounts of biomass are hard maple (234 pounds per acre), white and green ash (172 pounds per acre), and elm (169 pounds per acre).

⁶A weighted average based on the number of plots sampled in each forest type and the biomass of each species in the type, including types in which the shrub species was not found.

Poison ivy produces the greatest average biomass among low shrubs (109 pounds per acre green weight), followed by Virginia creeper (97 pounds per acre), raspberry-blackberry (86 pounds per acre), and honeysuckle (43 pounds per acre).

FUTURE TIMBER SUPPLY PROJECTED

The results of this third forest inventory of Indiana show that net annual growth of growing stock stood at 153.6 million cubic feet in 1985, up from 103.5 million in 1966. During this same period timber removals from growing stock increased from 64.9 million cubic feet in 1966 to 92.8 in 1985. The volume of growing stock in Indiana rose from 3.7 billion cubic feet in 1967 to 5.2 billion in 1986. The area of timberland in the State rose from 3.9 million acres in 1967 to 4.3 million in 1986.

With these past trends as prologue, we now confront the question of what might be expected to happen in the coming 30 years. In this section we present two projections of inventory, growth, and removals: a low removals option and a high removals option. The high removals projection is based on the assumption that timber removals will continue to increase at about the same rate as over the past 36 years. The low removals projection assumes that increases will be more modest. Three additional

assumptions are common to both projections. The first is that despite the gradual increase in timberland over the past 36 years, the area of timberland in Indiana will decline slightly to 4.1 million acres in 2016. Most of this decline will occur as a result of increasing urbanization, primarily in the northern more heavily populated part of the State. The second assumption is that the rate of net annual growth of growing stock will remain at 2.9 percent of inventory. The final assumption is that there will be no major changes in the economic, social, or political climate.

Low Removals Option Projection

In this projection timber removals will increase 28 percent from 92.8 million cubic feet in 1986 to 119.0 million in 2016 (fig. 18). This slight increase in removals causes a significant increase in the timber inventory and in realized growth. The inventory rises from 5.2 billion cubic feet in 1986 to 7.0 billion in 2016. Net annual growth increases from 153.6 million cubic feet in 1986 to 203.3 million in 2016. Thus, in this projection the ratio of growth to removals remains nearly constant.

High Removals Option Projection

In this projection removals nearly double over the projection period. By 2016 removals stand at

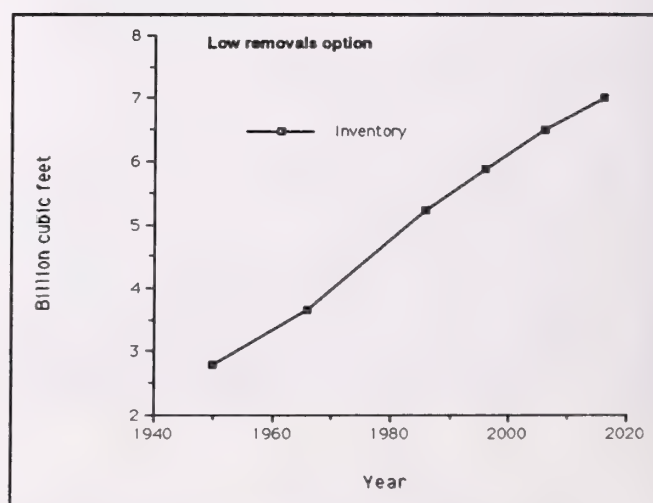
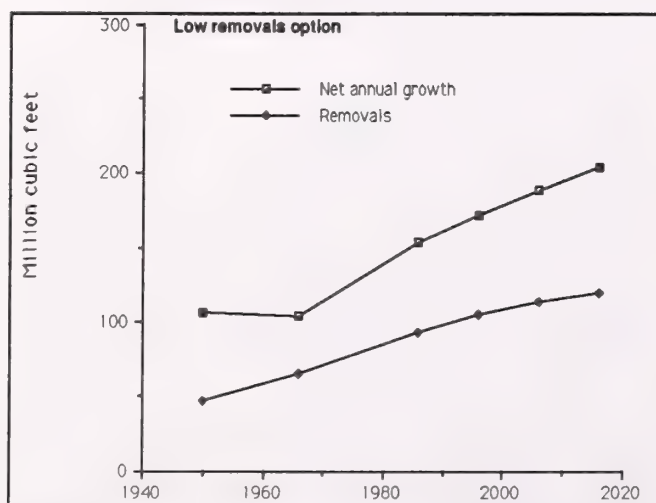


Figure 18.—Removals, net growth, and inventory of growing stock in Indiana, 1950-1986, and low removals projection for 1987-2016.

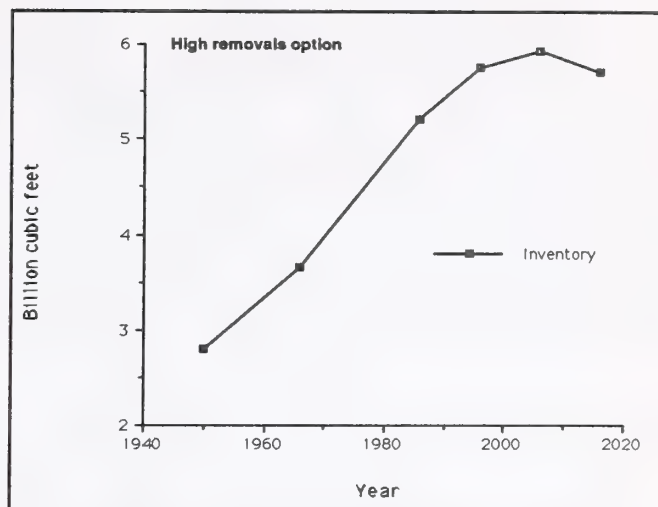
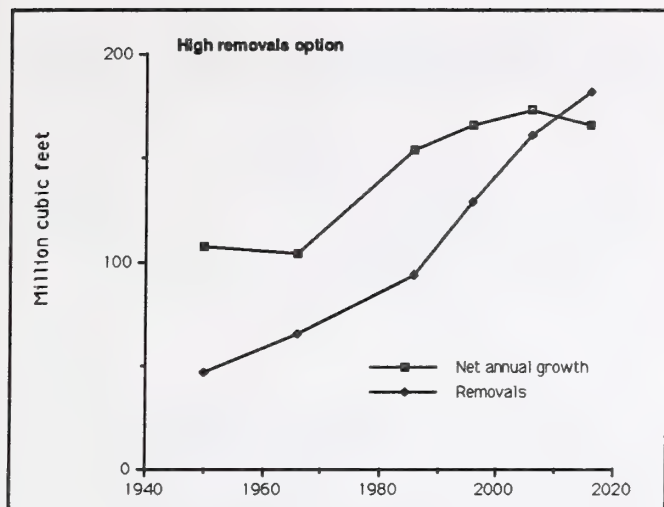


Figure 19.—Removals, net growth, and inventory of growing stock in Indiana, 1950-1986, and high removals projection for 1987-2016.

181.5 million cubic feet (fig. 19). Net annual growth however, rises modestly to 172.5 million in 2006. Then, as a result of the decrease in timberland, it declines to 165.5 million cubic feet in 2016. By 2011 removals exceed growth. The inventory increases to 5.9 billion cubic feet in 2006 and then declines to 5.7 billion in 2016.

These two projections represent the bounds within which we expect the actual future situation to develop. As the two diverge the future becomes more uncertain. In the first decade we feel that changing economic and social conditions will have less opportunity to invalidate the projections. Beyond the first decade it becomes less likely that all the assumptions upon which either of the projections is based will be realized.

These projections, also, do not depict desirable silvicultural or management objectives. Rather they represent what is likely to occur given the assumptions and biology of the resource. As these projections indicate, there is a real prospect that timber removals could exceed growth in many parts of Indiana in the long term. Will this prospect spur increased forest management? More than 87 percent of the State's timberland is held by nonindustrial private owners. Historically these owners have not engaged in forest management of their lands for a number of

reasons. In Indiana, improving the resource will require that private owners practice active forest management. To accomplish this will require an increased education, information and assistance program for landowners. An added inducement to forest management, however, may be the prospect of a declining supply of timber. As supplies dwindle, prices of acceptable and available timber should rise. As owners contemplate an expected rise in stumpage prices, they may become more aware of the value of their timberland. As this happens they are also likely to become interested in ways to increase its value beyond what nature alone can do.

For these reasons the scenario that we see evolving over the next 30 years is a modest rise in stumpage prices in real terms accompanied by a modest increase in forest management by nonindustrial private owners. We do not expect that removals will exceed growth over widespread areas or over a range of species. This does not, however, rule out isolated instances of overcutting of particular species. In fact, current timber removals in 1985 were greater than growth for other white oaks, select red oaks, other red oaks, and elm.

FOREST PRODUCTS IMPORTANT TO THE ECONOMY

Nearly 44,000 Hoosiers employed by more than 1,000 businesses owed their livelihood to the forest resources of Indiana in 1982 (U.S. Department of Commerce 1985). As a collective group, the Indiana forest products industries (lumber and wood products, furniture and fixtures, and paper and allied products) ranked as the State's sixth largest employer in terms of employment and payroll within manufacturing industries (fig. 20). The three forest products industries combined generated \$2.4 billion in value added by manufacture to the State's economy in 1982.

More than 300 primary wood-using industries in Indiana purchased unprocessed forest products in 1984 (Blyth *et al.* 1987). Examples of primary industries in Indiana include sawmills, veneer mills, handle plants, cooperage mills, one pulp mill, and specialty mills. The remaining 600+ firms are categorized as secondary industries that utilize primary wood products in the process of manufacturing consumer goods. Examples of secondary industries include furniture, cabinet and novelty manufacture, finished paper, millwork, and other specialty manufactured goods.



Figure 20.—Indiana's forest products industry paid \$673.8 million in wages to employees in 1982, and annually purchases standing trees worth an estimated \$50 million from State landowners.

Although the number of primary mills in Indiana has decreased since 1966, the volume of roundwood processed has continued to increase. This paradox can be explained by the fact that most mills that have closed have tended to be smaller, while new mills being established tend to be larger, and existing mills continue to improve their efficiency. Likewise, the number of face veneer mills in Indiana has continued to decline since 1961, with 18 mills producing at present.

Indiana roundwood production in 1984 was estimated to be 65.6 million cubic feet of roundwood (Blyth *et al.* 1987). Wood residues produced at primary wood-using mills in the State were estimated at almost 1.0 million tons green weight in 1984. More than 90 percent of the residue is utilized in such products as pulpwood chips, livestock bedding and mulches, residential firewood, fiber products, industrial fuel, and soil conditioners.

NONTIMBER RESOURCES DISCUSSED

Timber is a forest resource that is relatively easy to measure and whose impact in the marketplace can readily be assessed. The quantity and values of other forest resources are often difficult to estimate. Forest recreation, for example, is often produced jointly with other forest products (perhaps timber and water), which makes it difficult to separate costs and returns specific to recreation. And the forest wildlife resource is mobile and can move in and out of the sampling area, which makes an accurate census difficult to obtain.

Despite these difficulties, the Forest and Rangeland Renewable Resources Planning Act of 1974 (P.L. 93-378) directs the Department of Agriculture to conduct inventories of all outputs from the Nation's forests and rangeland, to analyze present and anticipated supplies and demand, and to suggest opportunities for improving yields.

Indiana's citizens enjoy a wide range of outdoor recreational activities at many diverse facilities. Forests play a direct or indirect role in many of these activities or facilities. Forests may serve to heighten the enjoyment of the recreational experience by influencing water quality, providing wildlife habitat, and increasing the esthetic

value of a site. Forests also add variety to the Hoosier landscape and contribute significantly to the quality of life.

Geology and Soils⁷

There are three general sources of parent material in Indiana: the underlying bedrock, material deposited by continental glaciation, and materials moved about by ongoing geological processes.

Bedrock underlying Indiana is composed of sedimentary rock. This rock formed in place by the deposition and cementation of minerals, shells of organisms, or rock fragments or by the precipitation of salts from solution. In general, Indiana bedrock is youngest on the west side of the State and oldest on the east side (Indiana Department of Natural Resources 1984). All of Indiana's bedrock layers dip gently, slanting to the west and southwest. The youngest bedrock was formed more than 220 million years ago (MYA) in the western part of central and southern Indiana and is known for its coal deposits. The oldest bedrock, formed more than 360 MYA, is found in southeastern Indiana.

In the past one-half million years Indiana has been influenced by continental glaciers, similar to ice sheets that cover much of Antarctica. These vast ice sheets are thought to have been as much as 3 kilometers thick in Indiana. Continental glaciation was caused by climatic fluctuations and by the same uplifting movements in the earth's crust that formed mountains on the North American continent. These basic changes caused continental glaciers to form in Canada and spread across the northern Midwest.

There were four known glacial episodes: the Nebraskan, Kansan, Illinoian, and Wisconsinan. Only the latter three are thought to have altered Indiana's topography. The second glacial episode, the Kansan, covered most of Indiana, and the material it deposited is considered the oldest glacial drift found in the State. The last glacial episode, the Wisconsinan, began about 70,000 years ago and achieved maximum coverage of Indiana 21,000 years ago.

⁷Source for this section is Indiana Department of Natural Resources, 1984.

Interglacial periods were characterized by warm temperatures, land dissection by streams, and general weathering of the landscape formed by the previous ice age. The influence of continental glaciation on the soils of Indiana is highly significant and has given Indiana some of the most fertile soils in the world. The glaciers are responsible for depositing material (glacial drift) that was composed of material scraped and moved from the area of the glacier's origin and laid down in Indiana.

Indiana is divided into two general areas: the glaciated areas that were covered by one or more continental glaciers, and unglaciated areas. Most of the State has been affected by glaciation. However, a finger-shaped area in the south-central part of the State (Knobs Unit) is unglaciated. The soils in the unglaciated area are residual soils; that is, they were formed in place over bedrock. In this region, bedrock outcroppings are common and the influence of glaciers is minimal. However, many of the soils in this area are covered by a cap of wind blown glacial material or loess.

The recently glaciated areas, which occur primarily over the northern two-thirds of the State, tend to be of higher potential productivity and are composed of younger soils. The unglaciated areas tend to be composed of soils that have been exposed to the weathering/leaching process for longer periods and are, therefore, of lower relative productivity. Potential managed forest productivity in Indiana ranges from about 600 board feet (International 1/4-inch rule) per acre per year for younger soils to about 135 board feet per acre per year for older, weathered soils in south-central Indiana.

Topography affects soil profile development primarily through its influence on water movement. On steep sites, water is more inclined to run off rather than percolate down through the soil horizons. This runoff moves surface materials from one location to another, affecting soil profiles at both the erosion site and the site of deposition. Water that runs off an area is not available to percolate down through the soil and, therefore, is not available for plant growth. Drier sites produce less total biomass, and consequently organic matter accumulates more slowly.

Generally, steep slopes retard soil profile development, causing sloping soils to have thinner surface layers, less organic matter, and less conspicuous differentiation between soil layers than soils on level ground.

The rate of soil development is also affected by the type of vegetation present. Most of Indiana's soils were formed under forested conditions. However, grasses played a significant role in soil development in some areas (such as prairies). In soils that formed under grassland, organic matter content is greater and is more uniformly distributed through the soil profile than in soils that formed under forest. Forest soils are lower in organic matter, which tends to be concentrated in the surface layers. Except for poorly drained soils, leaching of organic matter and clay particles occurs more rapidly in forest soils. As a result, soils formed under forests generally appear to be more weathered.

Fish and Wildlife^a

Wildlife is an important forest resource of interest to almost everyone. Approximately 365 species of birds, 54 species of mammals, and 84 species of amphibians and reptiles have been recorded in Indiana (Indiana Department of Natural Resources 1981). Of these, 166 kinds of birds and presumably all of the mammals, amphibians, and reptiles breed or formerly bred in the State. The remaining 199 species of birds occur or previously occurred as winter residents, spring and fall migrants, non-breeding summer visitors, or accidental visitors. The importance of forest land to wildlife in Indiana is shown by the number of species that breed in woodland versus other habitats.

Of 238 common Indiana species of mammals, breeding birds, reptiles and amphibians, fully 52 percent (124 different species) use forest land as their principal breeding habitat. An additional 38 percent use forest edge or reverting lands as their principal breeding habitat. The required or preferred habitat of many wildlife species includes more than one habitat type. For example,

many woodland animals require some brushland, openland, or water to successfully live and reproduce.

Another major consideration in assessing the importance of forest land to Indiana wildlife is the average density of wildlife populations and the total amount of wildlife on forest land as compared with the same measures on other habitat types. Breeding bird censuses have shown that forest land generally supports more nesting birds per acre than any other habitat type, and that 40 percent of Indiana's 97 million breeding birds nest on forest land. Winter bird counts indicate that forest land generally supports more wintering birds per acre than any other habitat type except brushland and orchard, and that 20 percent of Indiana's 34 million wintering birds live on forest land. These counts also show that more birds winter in forest land than in any other habitat type in the State. Scores of additional bird species and millions of individuals depend partly or completely on forest land during spring and fall migrations.

One species of snake, nine species of birds, and twelve species of mammals have been extirpated from Indiana in recent history. Of these 22 extirpated species, 16 species depend either partly or fully upon forest land for their survival. Three kinds of birds and eight kinds of mammals are designated as endangered in Indiana. All of the endangered species in the State depend at least partly on forest land for their survival.

More people use public wildlife areas and refuges for non-consumptive, wildlife-oriented recreation than for hunting, fishing, and trapping. No data are available on statewide use of public or private forest land by birdwatchers, wildlife photographers and other wildlife observers.

Hunting is a very popular recreational activity in Indiana, with 14 percent of the population participating at least once per year. About 248,000 hunting licenses were sold in Indiana in 1987-1988, which accounted for more than \$3 million in license revenue (Indiana Department of Natural Resources 1988). Although more than 400,000 acres of public land are available for hunting, the private landowner provides the bulk of the land for this sport.

^aSources for this section are Indiana Department of Natural Resources, 1981 and 1988.

The most popular game animals in Indiana's forests include white-tailed deer, eastern wild turkey, fox and gray squirrels, and the cottontail rabbit. Other species such as the bobwhite quail, ruffed grouse, raccoon, and wood duck are taken in lesser amounts. Due to hunting pressures, all of the mentioned species are subjects of habitat management and research.

Furbearing animals continue to have economic importance, as evidenced by the purchase of more than 11,000 trapping licenses in Indiana in 1987-1988. The primary species taken include raccoon, opossum, red and gray fox, coyote, beaver, muskrat, and mink. Most of these furbearing species rely on forest land for habitat.

Although opportunities for fishing are relatively limited in Indiana, the sport continues to be popular, with 549,000 licenses sold in 1987-1988. About 165 endemic species of fish exist in various aquatic habitats.

A single wind-thrown tree, a tree overhanging a stream with its roots exposed to water's action, or overhanging vegetation can be a tremendous benefit to animal life in a stream. The momentarily slowed water will deposit suspended silt particles as well as be slightly lower in temperature than water in unshaded areas. This clearer, cooler water is preferred by game fish species. Turbulence caused by stream obstructions can create pools, and the resulting downstream riffle serves to oxygenate the stream's water, thereby improving habitat for fish and the aquatic organisms on which they feed. The exposed roots or overhead tree trunks offer cover for a variety of aquatic animals in addition to fish.

These effects of one tree on a stream are magnified manyfold by a forest encompassing all or part of a watershed. Runoff is slowed by forest vegetation, reducing stream siltation. The forest canopy, by shading the stream, helps to maintain cool water and high levels of dissolved oxygen. The forest vegetation and soils intercept vast quantities of phosphates and nitrates, as well as herbicides and pesticides from adjacent agricultural and developed areas, before they reach and pollute waterways. Excessive amounts of phosphates and nitrate accelerate the natural aging of lakes, while large pesticide concentrations harm the sensitive micro-ecosystems on which all fish populations depend.

Certain tree species, such as oaks and pines, make the soils in which they grow more acidic. Lakes and streams in watersheds in which these species predominate are likely to become more acidic over time, thereby affecting fish habitat by favoring species that prefer more acidic water. The leaf litter of forests harbors many valuable fish foods in the form of slugs, snails, worms, and other invertebrates. This litter layer may also be the source of carbonic acid that leaches into streams, again affecting pH and dissolved oxygen levels as well as coloring the water amber. If this decaying leaf litter becomes too abundant in an aquatic habitat, however, its decomposition may reduce dissolved oxygen levels.

Forest areas adjacent to streams, lakes, cropland, and idle lands generally support particularly diverse wildlife communities and help protect water quality. Sound land use management and cautious forest management are paramount if fish and wildlife communities are to be maintained or improved.

Outdoor Recreation⁹

Indiana's forest lands provide a wide range of recreational opportunities at diverse types of facilities and areas. There are approximately 730,614 acres of publicly owned land and water recreational areas in Indiana, accounting for 3.2 percent of the total land area of the State (Indiana Department of Natural Resources 1988). Given a State population of about 5.5 million citizens, the amount of recreation land available to each person is only about one-eighth of an acre. The recreation area per person is least in the central part of the State (22 people/recreation acre) and greatest in the southern part (3 people/recreation acre).

Of the total land and water recreation areas, 328,251 acres are classified as forest recreation areas. Although this forest recreation area is less than 1 percent of the total State acreage, it accounts for the largest percentage (47 percent) of the total recreational acreage.

Almost all of the publicly owned forest recreational land is held by the Federal and State

⁹Source for this section is Indiana Department of Natural Resources, 1988.

governments. Private sector forest recreation land does exist, although statistics on these lands are limited. Of the approximately 120 dedicated nature preserves in the State, about 45 are held by conservation organizations such as the Indiana Audubon Society, the Nature Conservancy, and Acres, Inc.

Principal activities on forest recreation land include hunting, hiking, backpacking, picnicking, horseback riding, camping, snowmobiling, cross country skiing, birdwatching, nature interpretation, and research. Multiple use management prevails on most of the forest recreation areas in the State; a preservation philosophy exists on the 120 dedicated nature preserves, the 12,935-acre Charles C. Deam Wilderness Area on the Hoosier National Forest, and the 19 State Parks.

Recreation interests are guided by a plan designed to determine, promote, and implement a statewide coordinated program enabling quality recreational opportunities. This plan functions as a guide for acquiring, developing, and managing recreation areas, and meets the requirements

of eligibility for the Federal Land and Water Conservation Fund Act of 1965. The title of this document composed by the Indiana Division of Outdoor Recreation is: "Indiana Outdoor Recreation, 1989, An Assessment and Policy Plan."

In 1986, the Indiana Department of Natural Resources, Division of Outdoor Recreation, began to assemble an inventory of all Indiana's publicly owned outdoor recreation areas. This inventory was the first major update of the "1976 Inventory of Outdoor Recreation Facilities." In the process of updating the 1976 inventory, several changes were made to make the data more useful. Some of these changes were major. Consequently, the current data are not easily comparable to the data in the 1976 inventory.

Most of the inventory is made up of public sector facilities. Areas operated by park agencies, as well as non-park agencies, are included. Because public school and university facilities are often available for public use, they also are included in the inventory. Tables 4, 5, and 6 show outdoor recreation area acreages as of February 1988.

Table 4.—Area of public land and water recreation areas, by category and region, Indiana, 1988

| Category | North | Central | South | Statewide |
|--|-----------|-----------|-----------|------------|
| Public sector (acres) | 102,339 | 94,671 | 500,491 | 697,501 |
| Public schools/universities (acres) | 8,967 | 15,513 | 8,633 | 33,113 |
| Total recreation acres | 111,306 | 110,184 | 509,124 | 730,614 |
| Total land area (acres) | 5,102,707 | 8,876,435 | 9,179,482 | 23,158,625 |
| Recreation area (percent) | 2.2 | 1.2 | 5.5 | 3.2 |
| Population (number) | 1,753,005 | 2,381,006 | 1,363,921 | 5,497,932 |
| Recreation acres/ 1,000 persons | 63 | 46 | 373 | 133 |
| People/recreation acre | 16 | 22 | 3 | 8 |

Table 5.—Number of acres and number of recreation areas by area type for type of owner/operator, Indiana, 1988

| Area type | Federal | | | State | | | County | | | Township | | | Municipal | | | Total | | |
|-----------------------------|---------|-----------|--|---------|-----------|--|--------|-----------|--|----------|-----------|--|-----------|-----------|--|---------|-----------|--|
| | Acres | No. areas | | Acres | No. areas | | Acres | No. areas | | Acres | No. areas | | Acres | No. areas | | Acres | No. areas | |
| Park/recreation | 15,474 | 9 | | 58,731 | 27 | | 15,724 | 184 | | 578 | 28 | | 44,370 | 1,790 | | 135,186 | 2,070 | |
| Forest | 186,206 | 4 | | 141,760 | 14 | | 240 | 2 | | — | — | | 45 | 1 | | 328,251 | 21 | |
| Fish/wildlife | 7,744 | 2 | | 97,903 | 40 | | 200 | 6 | | — | — | | 57 | 3 | | 105,904 | 51 | |
| Fishing/boating access site | 132 | 11 | | 263 | 166 | | 10 | 7 | | — | — | | 27 | 17 | | 433 | 203 | |
| State dedicated | — | — | | 10,867 | 66 | | 530 | 6 | | — | — | | 503 | 9 | | 11,900 | 81 | |
| Nature preserve | — | — | | 114,369 | 10 | | — | — | | — | — | | 1,800 | 8 | | 116,169 | 18 | |
| Reservoir | — | — | | — | — | | — | — | | — | — | | — | — | | — | — | |
| Historic/cultural | 210 | 2 | | 877 | 18 | | 437 | 9 | | 2 | 1 | | 16 | 22 | | 1,567 | 53 | |

Table 6.—*Number of public sector recreational areas offering each type of activity/facility, by region, Indiana, 1988*

(In number of areas)

| Activities/facilities | North | Central | South | Statewide |
|----------------------------------|-------|---------|-------|-----------|
| Boating | 196 | 68 | 157 | 421 |
| Waterskiing | 21 | 7 | 35 | 63 |
| Canoeing | 156 | 52 | 108 | 316 |
| Fishing | 307 | 127 | 209 | 643 |
| Picnicking | 563 | 513 | 407 | 1,483 |
| Camping | 31 | 37 | 80 | 148 |
| Playground | 525 | 495 | 352 | 1,372 |
| Swimming beach | 51 | 18 | 30 | 99 |
| Swimming pool | 49 | 73 | 65 | 187 |
| Tennis courts | 199 | 203 | 135 | 537 |
| Softball/baseball | 305 | 317 | 211 | 833 |
| Football/soccer | 77 | 81 | 35 | 193 |
| Basketball | 312 | 336 | 205 | 853 |
| Golf | 19 | 23 | 19 | 61 |
| Miniature golf | 1 | 10 | 5 | 16 |
| Handball/racquetball | 5 | 1 | 5 | 11 |
| Horseshoe courts | 109 | 118 | 89 | 316 |
| Shuffleboard courts | 48 | 32 | 16 | 96 |
| Volleyball | 87 | 101 | 62 | 250 |
| Foot trails | 102 | 98 | 98 | 298 |
| Fitness trails | 41 | 27 | 14 | 82 |
| Bike trails | 11 | 19 | 8 | 38 |
| Horse trails | 6 | 7 | 23 | 36 |
| ORV trails | — | — | — | — |
| Backpacking | 1 | 4 | 8 | 13 |
| Group camp buildings | 3 | 1 | 7 | 11 |
| Cabins | 4 | 5 | 7 | 16 |
| Inns | 1 | 1 | 5 | 7 |
| Hunting | 19 | 11 | 39 | 69 |
| Shooting range | 9 | 7 | 5 | 21 |
| Archery range | 19 | 6 | 10 | 35 |
| Zoo | 3 | 1 | 2 | 6 |
| Nature interpretation | 49 | 33 | 43 | 125 |
| Nature center | 15 | 5 | 15 | 35 |
| Cultural/historic interpretation | 14 | 17 | 25 | 56 |
| Visitor center | 8 | 3 | 14 | 25 |
| Amphitheaters | 23 | 12 | 22 | 57 |
| Snowmobile trails | 3 | 5 | — | 8 |
| Ice skating | 92 | 32 | 12 | 136 |
| Cross-country skiing | 56 | 16 | 2 | 74 |
| Downhill skiing | — | — | — | — |
| Sledding/tobogganing | 35 | 13 | 1 | 49 |
| No activities/facilities | 139 | 77 | 57 | 273 |

LITERATURE CITED

- Blyth, James E.; McGuire, Donald H.; Smith, W. Brad. 1987. **Indiana timber industry—an assessment of timber product output and use**. Resour. Bull. NC-102. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 34 p.
- Hansen, Mark H. 1987. **Forest area in Indiana, 1986**. Res. Note NC-341. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 5 p.
- Hansen, Mark H.; Golitz, Mark F. 1988. **Timber resource of the Indiana Knobs Unit, 1986**. Resour. Bull. NC-104. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 92 p.
- Indiana Department of Natural Resources. 1981. **Indiana forest resource management guide**. Indianapolis, IN: Division of Forestry. 191 p.
- Indiana Department of Natural Resources. 1984. **Indiana forest soils handbook**. Indianapolis, IN: Division of Forestry. 162 p.
- Indiana Department of Natural Resources. 1988. **70th annual report, 7/1/87 through 6/30/88**. Indianapolis, IN: Division of Fish and Wildlife. 88 p.
- Indiana Department of Natural Resources. 1988. **Indiana outdoor recreation, 1989, an assessment and policy plan**. Indianapolis, IN: Division of Outdoor Recreation. 113 p.
- Leatherberry, Earl C. 1987. **Timber volume in Indiana, 1986**. Res. Note NC-343. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 9 p.
- Little, Elbert L. 1979. **Checklist of native and naturalized trees of the United States**. Agric. Handb. 541. Washington, DC: U.S. Department of Agriculture, Forest Service. 375 p.
- Loetsch, F.; Haller, K. E. 1964. **Forest inventory**. Volume 1: Statistics of forest inventory and information from aerial photographs. BLV Verlagsgesellschaft Munch Basle Vienna. 436 p.
- Miner, Cynthia L.; Walters, Nancy R. 1984. **STEMS: a nontechnical description for foresters**. Res. Pap. NC-252. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 12 p.
- Rast, Everette D.; Sonderman, David L.; Gammon, Glenn L. 1973. **A guide to hardwood log grading**. Gen. Tech. Rep. NE-1. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 31 p.
- Shifley, S. F. 1987. **A generalized system of models forecasting Central States tree growth**. Res. Pap. NC-279. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 10 p.
- Smith, W. Brad. 1983. **Adjusting the STEMS regional growth models to improve local predictions**. Res. Note NC-297. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 5 p.
- Smith, W. Brad. 1985. **Factors and equations to estimate forest biomass in the North Central Region**. Res. Pap. NC-268. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 6 p.
- Smith, W. Brad; Golitz, Mark F. 1988. **Indiana forest statistics, 1986**. Resour. Bull. NC-108. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 139 p.
- Smith, W. Brad; Weist, Carol A. 1982. **A net volume equation for Indiana**. Resour. Bull. NC-63. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 7 p.
- Spencer, John S., Jr. 1969. **Indiana's timber**. Resour. Bull. NC-7. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 61 p.
- Spurr, Stephen H.; Vaux, Henry J. 1976. **Timber: biological and economic potential**. Science. 191(4228): 751-756.

U.S. Department of Agriculture. 1953. **Forest Statistics of Indiana**. Forest Survey Release 15. Columbus, OH: U.S. Department of Agriculture, Forest Service, Central States Forest Experiment Station. 36 p.

U.S. Department of Commerce. 1985. **1982 Census of Manufactures**. Geographic Area

Series, Indiana. MC82-A-15. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 79 p.

Wiant, Harry V., Jr.; Castenaeda, Froylan. 1977. **Mesavage and Girard's volume tables formulated**. BLM4. Denver, CO: U.S. Department of the Interior, Bureau of Land Management, Denver Service Center: 1-4.

APPENDIX

ACCURACY OF THE SURVEY

Forest Inventory and Analysis information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit levels. Consequently, the reported figures are estimates only. A measure of reliability of these figures is given by sampling errors. These sampling errors mean that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated.

For example, the estimated growing-stock volume in the State in 1986, 5,217.9 million cubic feet, has a sampling error of ± 1.57 percent (± 81.9 million cubic feet). The growing-stock volume from a 100-percent inventory would be expected to fall between 5,136.0 and 5,299.8 million cubic feet ($5,217.9 \pm 81.9$), there being a one in three chance that this is not the case.

Table 7 shows the sampling errors for the 1986 Indiana Forest Inventory:

Table 7.—*Sampling errors for State totals of volume, growth, average annual removals, and timberland area, Indiana, 1986*

| Item | State totals | Sampling error |
|-------------------------------------|---------------------------|----------------|
| Growing stock | <i>Million cubic feet</i> | <i>Percent</i> |
| Volume (1986) | 5,217.9 | 1.57 |
| Growth (1985) | 142.1 | 3.42 |
| Average annual removals (1966-1985) | 72.6 | 5.40 |
| Sawtimber | <i>Million board feet</i> | |
| Volume (1986) | 19,224.2 | 1.86 |
| Growth (1985) | 729.1 | 5.47 |
| Average annual removals (1966-1985) | 314.0 | 5.68 |
| Timberland | <i>Thousand acres</i> | |
| Area (1986) | 4,295.8 | 1.00 |

As survey data are broken down into sections smaller than State or Survey Unit totals, the sampling error increases. For example, the sampling error for timberland area in a particular county is higher than that for total timberland area in the Unit. Table 39 shows the sampling errors for Unit and county totals. To use this table for data smaller than county totals, use the following formula to compute error estimates:

$$E = \frac{(SE) \sqrt{(\text{Unit total area or volume})}}{\sqrt{(\text{Volume or area smaller than Unit total})}}$$

where:

E = sampling error in percent

SE = Unit total error for area or volume

For example, to compute the error on the area of oak-hickory type in Jackson County, proceed as follows:

Area of oak-hickory type in Jackson County from table 14 = 50,300 acres

Area of all timberland in the Knobs Unit from table 14 = 1,741,100 acres

Unit total error for area in the Knobs Unit from table 39 = 0.83 percent

Using the formula above:

$$\begin{aligned} \text{Error} &= \frac{(0.83) \sqrt{1,741,100}}{\sqrt{50,300}} \\ &= \pm 4.88 \text{ percent} \end{aligned}$$

SURVEY PROCEDURES

Two-phase sampling using both new and remeasurement ground plots was used in this inventory. The major steps in the Indiana Forest Inventory were as follows:

1. Aerial photography (Phase 1)

Aerial photographs of the entire area were obtained from the Hoosier National Forest and USDA Agricultural Stabilization and Conservation Service. Nine-inch square, black and white Panchromatic prints on a scale of 1:40,000 were used throughout the entire State. Approximate date of photography for each county is shown in table 8. For those counties with photos taken before 1980, National High Altitude Photography (NHAP) photos were used to verify change information. The NHAP photos were taken between 1981 and 1983.

The locations of the plots used in the 1967 inventory were transferred to these new photographs. Photographs were assembled into township mosaics, and a systematic grid of 121 one-acre points (each point representing approximately 190.4 acres) was overlaid on each township mosaic. Each of these points (both the new systematic grid points and the old sample plots) was examined by aerial photogrammetrists and classified stereoscopically based on land use. If trees were present, forest type and stand size-density class were recorded. Then all the old sample locations and a sample of the new points were sent to the field for the field crew to verify the photo classification and to take further measurements. A total of 126,629 points (120,949 new and 5,680 old) was examined stereoscopically (table 9).

2. Plot measurements (Phase 2)

Each plot location was visited on the ground by a Forest Service field crew. The crew classified the plot based on its current land use and recorded various other descriptive information. Table 10 summarizes the results of this step of the inventory:

Table 8.—*Dates of aerial photography by county and Forest Survey Unit, Indiana*

| Unit and County | Date | Unit and County | Date |
|--------------------------|-------|----------------------|-------|
| Lower Wabash Unit | | Northern Unit | |
| Clay | 10-80 | Adams | 4-83 |
| Daviess | 9-74 | Allen | 5-81 |
| Gibson | 10-74 | Bartholomew | 11-80 |
| Greene | 10-80 | Benton | 6-83 |
| Knox | 4-78 | Blackford | 9-80 |
| Martin | 9-74 | Boone | 5-72 |
| Parke | 6-71 | Carroll | 11-81 |
| Pike | 9-74 | Cass | 4-82 |
| Posey | 6-80 | Clinton | 5-72 |
| Putnam | 4-78 | Decatur | 10-81 |
| Sullivan | 9-74 | DeKalb | 6-72 |
| Vanderburgh | 6-80 | Delaware | 6-80 |
| Vermillion | 9-72 | Elkhart | 5-81 |
| Vigo | 9-74 | Fountain | 6-83 |
| | | Fulton | 10-80 |
| | | Grant | 6-80 |
| | | Hamilton | 5-82 |
| | | Hancock | 5-80 |
| | | Hendricks | 4-78 |
| Knobs Unit | | Henry | 6-80 |
| Brown | 10-80 | Howard | 5-84 |
| Clark | 10-81 | Huntington | 4-82 |
| Crawford | 11-79 | Jasper | 4-84 |
| Dubois | 11-79 | Jay | 9-80 |
| Floyd | 6-80 | Johnson | 9-72 |
| Harrison | 6-80 | Kosciusko | 7-73 |
| Jackson | 10-80 | LaGrange | 10-74 |
| Lawrence | 9-79 | Lake | 9-73 |
| Monroe | 10-80 | LaPorte | 11-81 |
| Morgan | 10-80 | Madison | 6-80 |
| Orange | 9-79 | Marion | 8-71 |
| Owen | 10-80 | Marshall | 7-73 |
| Perry | 11-79 | Miami | 10-80 |
| Scott | 10-80 | Montgomery | 7-71 |
| Spencer | 9-74 | Newton | 6-82 |
| Warrick | 6-80 | Noble | 7-73 |
| Washington | 10-80 | Porter | 6-82 |
| | | Pulaski | 5-81 |
| | | Randolph | 9-80 |
| | | Rush | 10-81 |
| Upland Flats Unit | | St. Joseph | 10-80 |
| Dearborn | 7-80 | Selby | 6-80 |
| Fayette | 10-81 | Starke | 5-81 |
| Franklin | 10-71 | Stueben | 7-73 |
| Jefferson | 10-80 | Tippecanoe | 6-71 |
| Jennings | 10-81 | Tipton | 6-72 |
| Ohio | 7-80 | Wabash | 6-72 |
| Ripley | 10-81 | Warren | 6-83 |
| Switzerland | 7-80 | Wayne | 10-80 |
| Union | 10-81 | Wells | 6-72 |
| | | White | 4-82 |
| | | Whitley | 6-72 |

Table 9.—Aerial photo points classified by photo land class and Forest Survey Unit, Indiana, 1986

| Photo land class | Forest Survey Unit | | | | |
|-------------------------|--------------------|--------------|--------|--------------|----------|
| | All Units | Lower Wabash | Knobs | Upland Flats | Northern |
| Timberland | 24,462 | 4,794 | 9,665 | 2,840 | 7,163 |
| Reserved timberland | 830 | 61 | 223 | 176 | 370 |
| Questionable | 645 | 90 | 307 | 73 | 175 |
| Nonforest with trees | 3,842 | 871 | 639 | 454 | 1,878 |
| Nonforest without trees | 95,572 | 13,931 | 11,834 | 5,423 | 64,384 |
| Water | 1,178 | 285 | 265 | 77 | 651 |
| All classes | 126,629 | 20,032 | 22,933 | 9,043 | 74,621 |

Table 10.—Number of ground plots by ground land use class and Forest Survey Unit, Indiana, 1986

| Survey Unit and ground land use class | Old plots remeasured | New plots established | Total ground plots taken |
|---------------------------------------|----------------------|-----------------------|--------------------------|
| All Units | | | |
| Timberland | 1,059 | 939 | 1,998 |
| Reserved timberland | 27 | 115 | 142 |
| Nonforest with trees | 230 | 228 | 458 |
| Nonforest without trees | 4,308 | 4,416 | 8,724 |
| Water | 61 | 57 | 118 |
| Total | 5,685 | 5,755 | 11,440 |
| Lower Wabash Unit | | | |
| Timberland | 205 | 208 | 413 |
| Reserved timberland | 6 | 12 | 18 |
| Nonforest with trees | 55 | 43 | 98 |
| Nonforest without trees | 600 | 648 | 1,248 |
| Water | 14 | 12 | 26 |
| Total | 880 | 923 | 1,803 |
| Knobs Unit | | | |
| Timberland | 460 | 409 | 869 |
| Reserved timberland | 12 | 45 | 57 |
| Nonforest with trees | 65 | 62 | 127 |
| Nonforest without trees | 503 | 525 | 1,028 |
| Water | 16 | 16 | 32 |
| Total | 1,056 | 1,057 | 2,113 |
| Upland Flats Unit | | | |
| Timberland | 127 | 121 | 248 |
| Reserved timberland | 0 | 37 | 37 |
| Nonforest with trees | 27 | 36 | 63 |
| Nonforest without trees | 219 | 226 | 445 |
| Water | 7 | 2 | 9 |
| Total | 380 | 422 | 802 |
| Northern Unit | | | |
| Timberland | 267 | 201 | 468 |
| Reserved timberland | 9 | 21 | 30 |
| Nonforest with trees | 83 | 87 | 170 |
| Nonforest without trees | 2,986 | 3,017 | 6,003 |
| Water | 24 | 27 | 51 |
| Total | 3,369 | 3,353 | 6,722 |

On those plots classified as timberland, wooded pasture, or windbreak (at least 120 feet wide), a ground plot was established or remeasured. The ground plot consisted of a 10-point cluster covering approximately 1 acre. At each point, trees 5.0 inches or more in d.b.h. were sampled on a 37.5 Basal Area Factor (BAF) variable-radius plot, and trees less than 5.0 inches d.b.h. were sampled on a 1/300-acre fixed-radius plot.

3. Area estimates

Area estimates outside the Hoosier National Forest were made using two-phase estimation methods. In this type of estimation, a preliminary estimate of area by land use is made from the aerial photographs (phase 1) and corrected by the plot measurements (phase 2). A complete description of this estimation method is presented by Loetsch and Haller (1964). Estimates of area for a particular county are based on the aerial photo points taken in that county, corrected using all the ground plots in the Survey Unit, regardless of the county in which they were taken. This was done because there were not enough ground plots in any one county to accurately correct the aerial photo interpretation in that county. Unit-wide correction rates should be accurate at the county level because we have made every effort to ensure that the plot interpretation is consistent throughout each Survey Unit.

Area estimates within the Hoosier National Forest were obtained from compartment examination records maintained by the Forest Timber Management Staff. This is an intensive area inventory system in which, over a period of years, each stand in the Hoosier is mapped on aerial photographs and then classified by ground visits.

4. Volume estimates

Estimates of volume per acre are made from the trees measured on the 10-point plots. Estimates of volume per acre were multiplied by the area estimates to obtain estimates of total volume. Net cubic foot volumes are based on equations developed by Smith and Weist (1982) for use in Indiana. Biomass estimates are based on equations developed by Smith (1985).

The Forest Service reports all board foot volume in International 1/4-inch rule. Conversion factors for local use rules are often useful. Board foot Doyle conversion factors were derived from full tree measurements taken throughout the Central States (Illinois, Indiana, Iowa, and Missouri) and an equation developed by Wiant and Castenaeda (1977). Factors (multipliers) to convert board foot International volumes in this report to Doyle board feet by diameter class and softwoods and hardwoods are shown in table 11:

Table 11.—*Factors to convert sawtimber volume in International 1/4-inch rule to volume in Doyle rule by diameter class and softwoods and hardwoods*

| D.B.H. class (inches) | Doyle rule conversion factor | |
|--------------------------|------------------------------|-----------|
| | Softwoods | Hardwoods |
| 9.0-10.9 | 0.3455 | — |
| 11.0-12.9 | 0.4780 | 0.4172 |
| 13.0-14.9 | 0.5992 | 0.5118 |
| 15.0-16.9 | 0.6908 | 0.5882 |
| 17.0-18.9 | 0.7685 | 0.6569 |
| 19.0-20.9 | 0.8573 | 0.7180 |
| 21.0-22.9 | 0.8645 | 0.7829 |
| 23.0-24.9 | 0.9276 | 0.8324 |
| 25.0-26.9 | 0.9493 | 0.8736 |
| 27.0-28.9 | 0.9710 | 0.9473 |
| 29.0+ | 1.1065 | 1.1349 |

5. Growth and mortality estimates

On remeasurement plots, estimates of growth and mortality per acre come from the remeasured diameters of trees and from observation of trees that died between inventories. Growth is reported for 1985, the last year before the inventory, and is based on an assumption of constant basal area growth over the remeasurement period. Mortality is reported for 1985 also, and is based on an assumption of constant volume mortality over the remeasurement period.

On new plots, where trees were not remeasured, estimates of growth and mortality were obtained by using the Central States Stand and Tree Evaluation and Modeling System (STEMS) (Miner and Walters 1984, Shifley 1987) to project the growth and mortality of

trees for 1 year. The STEMS growth model was adjusted to meet local conditions, using the data from the remeasured plots and a method developed by Smith (1983). As with volume, total growth and mortality estimates were obtained by multiplying the per acre estimates by area estimates.

6. Average annual removals estimates

Average annual growing-stock and sawtimber removals (1966 to 1985) were estimated only from the remeasurement plots. These estimates are obtained from trees measured in the last survey and cut or otherwise removed from the timberland base. New plots were not used to estimate removals. Because the remeasurement plots made up only half of the total ground plots, average annual removals estimates have larger sampling errors than volume and growth estimates.

7. Timber removals, utilization, and timber product output estimates

Statistics on timber product output during 1984 came from canvassing (with a formal questionnaire) all the known primary wood-using mills that consume Indiana logs and bolts. Indiana Department of Natural Resources (IDNR) foresters personally canvassed all the known Indiana primary mills (except one pulpmill). IDNR utilization and marketing specialists provided estimates based on prior knowledge and contacts for a few mills that did not furnish complete data.

The North Central Forest Experiment Station mailed a formal questionnaire to the only Indiana pulpmill and all known out-of-State mills using Indiana roundwood. Follow-up on nonrespondents was by mail and telephone.

A sample of Illinois households and fuelwood producers provided estimates of fuelwood and post production in Illinois during 1983. Fuelwood and fencepost output in Indiana for 1984 was estimated by extrapolating the study results in Illinois to Indiana.

Wood utilization factors for converting timber products output to removals from growing stock were obtained during a 1984-1985

utilization study in Illinois, a 1971-1972 utilization study in Missouri, a 1966 utilization study in Indiana, and a 1964-1965 utilization study in Michigan.

Because this was a 100-percent sample of all primary wood-using mills, there is no sampling error reported for 1985 removals and timber products. This is not to say that the estimates reported here are totally accurate. Sampling error is a measure of precision, not accuracy, and tells in what range we would expect to obtain an estimate were we to repeat the procedure on a new sample. Because we sampled all mills, we would expect the same results if we repeated the procedure.

COMPARING INDIANA'S THIRD INVENTORY WITH THE SECOND INVENTORY

Data from new forest inventories are often compared with data from earlier inventories to determine trends in forest resources. However, changes in procedures and definitions between surveys often make it necessary to adjust earlier survey data so that they are comparable to data from the new survey. A consistency check was made for the Indiana inventory to ensure that the changes observed between inventories reflect actual changes in the resource and not changes in definitions or procedures.

Identifying and Correcting Procedural Changes

Between the 1967 and 1986 inventories of Indiana, some procedural changes were made in the method of deriving annual growth and mortality estimates and determining forest type. Also, different volume equations and forest types were used for the two inventories.

New volume equations were developed for Indiana, and these equations were used to compute the 1986 volumes and also to recompute the 1967 volume. The recomputed 1967 growing-stock volume averaged 4.3 percent greater than that reported in the 1967 report. Volumes for 1967 shown in this report are the recomputed volumes based on new volume equations and observations from the 1967 inventory.

Mortality figures published in the 1967 inventory report were based on field estimates from nonremeasurement plots. Information gathered on remeasurement plots during the current inventory was used to adjust the 1967 mortality figures. This adjustment, together with the new volume equations, also changed the estimate of net growth for the 1967 inventory.

In the 1967 report, fewer forest types were identified than in this report; however, all the types used in this report are subsets of forest types used in the old report. Areas and volumes in the oak-hickory type in 1967 will be in either the oak-hickory, chestnut-scarlet oak, or sassafras-persimmon type in 1986. Areas and volumes in the oak-gum-cypress type in 1967 will be in either the oak-gum or lowland oak type in 1986. Similarly, the 1967 elm-ash-cottonwood type is made up of the elm-ash-soft maple and cottonwood types in 1986; and the 1967 maple-beech-birch type is made up of the maple-beech and cherry-ash-yellow-poplar types in 1986. We could not classify the 1967 area by the 1985 types, so all comparisons must be made by combining 1986 data to reflect the 1967 types.

Checking for Consistency

A test was made by means of a computer program for updating and projecting timber volume, growth, and removals to ensure that it was possible to move from the adjusted 1967 resource statistics to the 1986 values. Using the adjusted 1967 volume, growth rates, and removals rates for the period between the two surveys, the program projected the inventory from 1967 to 1986. The program outputs volume, net growth, and removals of growing stock for every year in the period. Thus, inconsistencies in volume, growth, and removals were identified and resolved.

This program estimates how volume, growth, and removals could have logically changed over the inventory period to be consistent with the estimates of past and current volume, growth, and removals and average annual removals presented in this report. The growing-stock growth used for this program was increased by 6.1 million cubic feet per year in both 1967 and 1986 to account for nontimberland that converted to timberland. Between 1967 and 1986, we found that about 900,000 acres of nontimberland converted to timberland. The current growing-stock volume on this land is 514 million cubic feet. Removals did not require adjustment because they already include "other" removals (see Definition of Terms in Appendix), which includes the volume of timber on land that converted from timberland to nontimberland. Between 1967 and 1986, we found that about 500,000 acres of timberland converted to nontimberland. The growing-stock volume on this land was 400 million cubic feet in 1966.

LOG GRADE

In Indiana the butt log of every sawtimber sample tree was graded for quality. Additionally, all logs in a smaller sample of trees throughout the State were graded. The volume yield by log grade for each tree in the latter sample was used to distribute the volume of trees in the former sample into log-grade classes by species group. The resulting volumes by log-grade classes were expanded to provide an estimate for the entire State.

Logs were graded on the basis of external characteristics as indicators of quality. Hardwood species were graded according to "A guide to hardwood log grading" (Rast *et al.* 1973). The best 12-foot section of the lowest 16-foot hardwood log, or the best 12-foot upper section if the butt log did not meet minimum log-grade standards, was graded as follows:

Forest Service standard grades for hardwood factory saw logs

| Grading factors | | Specifications | | | | | | | | |
|---|--|-------------------------|----------------|-----|-------------------------|-----|-------|-----|----------------|--|
| | | Log grade 1 | | | Log grade 2 | | | | Log grade 3 | |
| Position in tree | | Butts only | Butts & uppers | | Butts & uppers | | | | Butts & uppers | |
| Scaling diameter, inches | | 13-15 ¹ | 16-19 | 20+ | 11+ ² | | 12+ | | 8+ | |
| Length without trim, feet | | | 10+ | | 10+ | 8-9 | 10-11 | 12+ | 8+ | |
| Required clear cuttings ³ of each of three best faces ⁴ | Min. length, feet | 7 | 5 | 3 | 3 | 3 | 3 | 3 | 2 | |
| | Max. number | 2 | 2 | 2 | 2 | 2 | 2 | 3 | No limit | |
| | Min. proportion of log length required in clear cutting | 5/6 | 5/6 | 5/6 | 2/3 | 3/4 | 2/3 | 2/3 | 1/2 | |
| Maximum sweep & crook allowance | For logs with less than one-fourth of end in sound defects | 15 percent | | | 30 percent | | | | 50 percent | |
| | For logs with more than one-fourth of end in sound defects | 10 percent | | | 20 percent | | | | 35 percent | |
| Maximum scaling deduction | | 40 percent ⁵ | | | 50 percent ⁶ | | | | 50 percent | |

¹Ash and basswood butts can be 12 inches if they otherwise meet requirements for small #1's.

²Ten-inch logs of all species can be #2 if they otherwise meet requirements for small #1's.

³A clear cutting is a portion of a face, extending the width of the face, that is free of defects.

⁴A face is one-fourth of the surface of the log as divided lengthwise.

⁵Otherwise #1 logs with 41- to 60-percent deductions can be #2.

⁶Otherwise #2 logs with 51- to 60-percent deductions can be #3.

Forest Service standard specifications for hardwood construction logs (tie and timber logs)¹

| | |
|--------------------------|--|
| Position in tree | Butts and uppers |
| Min. diameter, small end | 8 inches + |
| Min. length without trim | 8 feet |
| Clear cuttings | No requirements |
| Sweep allowance | One-fourth of the diameter at the small end for each 8 feet of length. |

Sound surface defects:

| | |
|---------------|--|
| Single knots | Any number, if no one knot has an average diameter above the callus in excess of one-third of the log diameter at point of occurrence. |
| Whorled knots | Any number, if the sum of knot diameters above the callus does not exceed one-third of the log diameter at point of occurrence. |
| Holes | Any number provided none has a diameter over one-third of the log diameter at point of occurrence, and none extends more than 3 inches into included timber ² . |

| | |
|---------------------------|--|
| Unsound surface defects : | Same requirements as for sound defects if they extend into included timber. No limit if they do not. |
|---------------------------|--|

End defects:

| | |
|---------|---|
| Sound | No requirements. |
| Unsound | None allowed; log must be sound internally, but will admit one shake not to exceed one-fourth the scaling diameter and will admit one longitudinal split not extending more than 5 inches into the included timber. |

¹These specifications are minimum for the class. If, from a group of logs, factory logs are selected first, thus leaving only nonfactory logs from which to select construction logs, then the quality range of the construction logs so selected is limited, and the class may be considered a grade. If selection for construction logs is given first priority, it may be necessary to subdivide the class into grades.

²Included timber is always square, and dimension is judged from small end.

Softwood species were graded according to the following specifications:

Log Grades for Eastern White Pine

| Log grade | Minimum size Diameter | Length ¹ | Sweep or crook allowance | Total cull allowance including sweep | Maximum weevil injury | Allowable knot size (Inches) ² on three best faces or minimum clearness on four faces |
|-----------|--------------------------|---------------------|--------------------------------|---|-----------------------------|---|
| | <i>Inches</i> | <i>Feet</i> | <i>Percent</i> | <i>Percent</i> | <i>Number</i> | <i>Inches</i> |
| 1 | 12 & 13 | 8-16 | 20 | 50 | 0 | Four faces clear full length |
| | 14+ | 10-16 | 20 | 50 | 0 | Two faces clear full length, or four faces clear 50 percent length (6 feet min. length) ³ |
| 2 | 6+ | 8-16 | 30 | 50 | 0 | Sound knots i.e. ⁴ D/6 and less than 3 inches ⁵ Unsound knots: i.e. 1-1/2 inches and for: butt logs i.e. D/12 upper logs i.e. D/10, or four faces clear 50 percent of length |
| 3 | 6+ | 8-16 | 40 | 50 | 8-foot logs: 1 weevil | Sound knots i.e. D/3 and less than 5 inches |
| | | | | | 10-foot+ logs: 2 weevils | Unsound knots i.e. D/6 and less than 2-1/2 inches |
| 4 | 6+ | 8-16 | 50 | 50 | No limit | No limit |

¹Plus trim.

²Disregard all knots less than 1/2-inch diameter in all grades.

³The sum of the diameter of sound knots plus twice the sum of the diameter of unsound knots (in inches) is less than or equal to half of the diameter of the log (inches).

⁴I.e. means less than or equal to.

⁵D means d.i.b. of log at location of knot.

Log Grades for Jack Pine and Red Pine

Grade 1: Logs with three or four clear faces.¹

Grade 2: Logs with one or two clear faces.

Grade 3: Logs with no clear faces.

After the tentative log grade is established from above, the log will be degraded one grade for each of the following, except that no log can be degraded below grade 3. Net scale after deduction for defect must be at least 50 percent of the gross contents of the log.

1. *Sweep.* Degrade any tentative 1 or 2 log one grade if sweep amounts to 3 or more inches and equals or exceeds one-third of the diameter inside bark at small end.

2. *Heart rot.* Degrade any tentative 1 or 2 log one grade if conk, massed hyphae, or other evidence of advanced heart rot is found anywhere in it.

¹A face is one-fourth of the circumference in width extending full length of the log. Clear faces are those free of: knots measuring more than 1/2-inch in diameter, overgrown knots of any size, and holes more than 1/4 inch in diameter. Faces may be rotated to obtain the maximum number of clear ones.

Log Grades for All Other Softwood Logs

Grade 1

1. Logs must be 16 inches in diameter or larger, 10 feet in length or longer, and with deduction for defect not over 30 percent of gross scale.
2. Logs must be at least 75 percent clear on each of three faces.
3. All knots outside clear cutting must be sound and not more than 2-1/2 inches in size.

Grade 2

1. Logs must be 12 inches in diameter or larger, 10 feet in length or longer, and with a net scale after deduction for defect of at least 50 percent of the gross scale deducted for defect.
2. Logs must be at least 50 percent clear on each of three faces or 75 percent clear on two faces.

Grade 3

1. Logs must be 6 inches in diameter or larger, 8 feet in length or longer, and with a net scale after deduction for defect of at least 50 percent of the gross contents of the log.

Note: A) Diameters are diameter inside bark (d.i.b.) at small end of log.
B) Percent clear refers to percent clear in one continuous section.

| | |
|---|---|
| Hackberry ¹² | <i>Celtis occidentalis</i> |
| Sycamore ¹² | <i>Platanus occidentalis</i> |
| Yellow-poplar ¹² | <i>Liriodendron tulipifera</i> |
| Black willow ¹² | <i>Salix nigra</i> |
| Sweetgum ¹² | <i>Liquidambar styraciflua</i> |
| Tupelo ¹² | |
| Black tupelo | <i>Nyssa sylvatica</i> var. <i>sylvatica</i> |
| Swamp tupelo..... | <i>Nyssa sylvatica</i> var. <i>biflora</i> |
| Persimmon ¹¹ | <i>Diospyros virginiana</i> |
| Sassafras ¹² | <i>Sassafras albidum</i> |
| Other hardwoods | |
| Ohio buckeye ¹² | <i>Aesculus glabra</i> |
| Boxelder ¹² | <i>Acer negundo</i> |
| Kentucky coffeetree ¹¹ | <i>Gymnocladus dioica</i> |
| Black locust ¹¹ | <i>Robinia pseudoacacia</i> |
| White mulberry ¹² | <i>Morus alba</i> |
| Red mulberry ¹² | <i>Morus rubra</i> |
| Flowering dogwood ¹¹ | <i>Cornus florida</i> |
| Honeylocust ¹¹ | <i>Gleditsia triacanthos</i> |
| Northern catalpa ¹¹ | <i>Catalpa speciosa</i> |
| European alder ¹² | <i>Alnus glutinosa</i> |
| White poplar ¹² | <i>Populus alba</i> |
| Yellow buckeye ¹² | <i>Aesculus octandra</i> |
| Noncommercial species | |
| Osage-orange | <i>Maclura pomifera</i> |
| Eastern hophornbeam..... | <i>Ostrya virginiana</i> |
| Apple | <i>Malus</i> spp. |
| American hornbeam..... | <i>Carpinus caroliniana</i> |
| Wild plum | <i>Prunus</i> spp. |
| Eastern redbud..... | <i>Cercis canadensis</i> |
| Pawpaw | <i>Asimina triloba</i> |
| Hawthorn | <i>Crataegus</i> spp. |
| Ailanthus | <i>Ailanthus altissima</i> |
| Chokecherry | <i>Prunus virginiana</i> |

DEFINITION OF TERMS

Average annual removals from growing stock.

—The average net growing-stock volume in growing-stock trees removed annually for forest products (including roundwood products and logging residues) and for other uses (see Other removals). Average annual removals of growing stock are reported for a period of several years (1966 to 1985 in this report) and are based on information obtained from remeasurement plots (see Survey Procedures in Appendix).

Average annual removals from sawtimber.—

The average net board foot sawtimber volume of live sawtimber trees removed annually for forest products (including roundwood products and other uses [see Other removals]). Average annual removals of sawtimber are reported for a period of several years (1966 to 1985 in this report) and are based on information obtained from remeasurement plots (see Survey Procedures in Appendix).

Basal area.—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand is summed, the result is usually expressed as square feet of basal area per acre.

Biomass.—The above-ground volume of all live trees (including bark and foliage) reported in green tons. Biomass is made up of four components:

Bole.—Biomass of a tree from 1 foot above the ground to a 4.0-inch top outside bark.

Tops and limbs.—Total biomass of a tree from a 1-foot stump minus the bole.

1.0- to 5.0-inch trees.—Total above-ground biomass of a tree from 1.0 to 5.0 inches in diameter at breast height.

Stump.—Biomass of a tree 5.0 inches d.b.h. and larger from the ground to a height of 1 foot.

Commercial species.—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam, osage-orange, and redbud.)

Commercial forest land.—(See Timberland).

Cord.—One standard cord is 128 cubic feet of stacked wood, including bark and air space. Cubic feet can be converted to standard cords by dividing by 79.

County and municipal land.—Land owned by counties and local public agencies or municipalities, or land leased to these governmental units for 50 years or more.

Cropland.—Land under cultivation within the past 24 months; including cropland harvested,

crop failures, cultivated summer fallow, idle cropland used only for pasture, orchards, and land in soil improvement crops, but excluding land cultivated in developing improved pasture.

Cull.—Portions of a tree that are unusable for industrial wood products because of rot, missing or dead material, or other defect.

Diameter class.—A classification of trees based on diameter outside bark, measured at breast height (d.b.h.). Two-inch diameter classes are commonly used in Forest Inventory and Analysis, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h.

Diameter at breast height (d.b.h.).—The outside bark diameter at 4.5 feet (1.37 m) above the forest floor on the uphill side of the tree. For determining breast height, the forest floor includes the duff layer that may be present, but does not include unincorporated woody debris that may rise above the ground line.

Farm.—Any place from which \$1,000 or more of agricultural products were produced and sold during the year.

Farmer-owned land.—Land owned by farm operators whether part of the farmstead or not. (Note: Excludes land leased by farm operators from nonfarm owners, such as railroad companies and States.)

Forest land.—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparing specified standards with basal area and/or number of trees, age or size, and spacing.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide. (See Tree, Land, Timberland, Reserved forest land, Other forest land, Stocking, and Water.)

Forest industry land.—Land owned by companies or individuals that operate a primary wood-using plant.

Forest type.—A classification of forest land based on the species forming a plurality of live tree stocking. Major forest types in the State are:

Jack-red-white pine.—Forests in which jack, red, or white pines, singly or in combination, comprise a plurality of the stocking. (These species are generally found in plantations in Indiana.)

Shortleaf pine.—Forests in which shortleaf pine comprises a plurality of the stocking. (Primarily plantations in Indiana.)

Scotch-Virginia pine.—Forests in which Scotch pine, Virginia pine, or eastern redcedar, singly or in combination, comprises a plurality of the stocking. (Common associates include oak, yellow-poplar, red maple, sassafras, and white pine.)

Oak-pine.—Forests in which hardwoods (usually white, scarlet, chestnut, northern red, or black oaks), singly or in combination, comprise a plurality of the stocking but where pines or eastern redcedar comprises 25 to 50 percent of the stocking. (Common associates include gum, hickory, sassafras, and yellow-poplar.)

Oak-hickory.—Forests in which upland oaks or hickories, singly or in combination, comprise a plurality of the stocking, and less than 25 percent of the stocking is in pines or eastern redcedar. (Common associates include yellow-poplar, elm, maple, black walnut, black locust, and sassafras.)

Chestnut-scarlet oak.—Forests in which chestnut oak or scarlet oak, singly or in combination, comprises a plurality of the stocking. (Common associates include eastern redcedar, black oak, white oak, and hickory.)

Sassafras-persimmon.—Forests in which sassafras and persimmon, singly or in combination, comprise at least 50 percent of the stocking. (Common associates include oak, yellow-poplar, elm, maple, and eastern redcedar.)

Oak-gum.—Bottomland forests in which tupelo, blackgum, sweetgum, oaks or cypress, singly or in combination, comprises a plurality of the stocking. (Common associates include cottonwood, willow, ash, elm, hackberry, and maple.)

Lowland oak.—Bottomland forests in which wet site oaks such as swamp chestnut, cherry-bark, and pin oak, singly or in combination, comprise a plurality of the stocking. (Common associates include swamp white oak, bur oak, soft maple, and sycamore.)

Elm-ash-soft maple.—Forests in which lowland elm, ash, soft maple, and cottonwood, singly or in combination, comprise a plurality of the stocking. (Common associates include boxelder, willow, sycamore, and beech.)

Cottonwood.—Forests in which cottonwood comprises at least 50 percent of the stocking. (Associates include willow, elm, soft maple, and ash.)

Maple-beech.—Forests in which hard maple or beech, singly or in combination, comprises a plurality of the stocking. (Common associates include soft maple, elm, and basswood.)

Cherry-ash-yellow-poplar.—Forests in which black cherry, white ash, and yellow-poplar, singly or in combination, comprise a plurality of the stocking. (Common associates include oak, maple, black walnut, beech, basswood, and sycamore.)

Growing-stock tree.—A live tree of commercial species that meets specified standards of size, quality, and merchantability. (Note: Excludes rough, rotten, and dead trees.)

Growing-stock volume.—Net volume in cubic feet of growing-stock trees 5 inches d.b.h. and over, from 1 foot above the ground to a minimum 4-inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs.

Hard hardwoods.—Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and ash.

Hardwoods.—Dicotyledonous trees, usually broad-leaved and deciduous. (See Soft hardwoods and Hard hardwoods.)

Idle farmland.—Includes former cropland, orchards, improved pastures, and farm sites not tended within the past 2 years and presently less than 16.7 percent stocked with trees.

Improved pasture.—Land currently improved for grazing by cultivating, seeding, irrigating, or clearing of trees or brush and less than 16.7 percent stocked with live trees.

Industrial wood.—All roundwood products, except fuelwood.

Land.—A. *Bureau of the Census.* Dry land and land temporarily or partly covered by water such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area. This is the same definition that the Soil Conservation Service uses in the National Resource Inventory. Bureau of the Census estimates of total land area were used in 1967; Soil Conservation Service estimates were used for 1986.

B. *Forest Inventory and Analysis.* The same as the Bureau of the Census, except minimum width of streams, etc., is 120 feet and minimum size of lakes, etc., is 1 acre.

Live trees.—Growing-stock, rough, and rotten trees 1.0 inch d.b.h. and larger.

Log grade.—A log classification based on external characteristics as indicators of quality or value. (See Appendix for specific grading factors used.)

Logging residues.—The unused growing stock portions of trees cut or killed by logging.

Maintained road.—Any road, hard-topped or other surface, that is plowed or graded at least once a year. Includes rights-of-way that are cut or treated to limit herbaceous growth.

Marsh.—Nonforest land that characteristically supports low, generally herbaceous or shrubby vegetation and that is intermittently covered with water.

Merchantable.—Refers to a pulpwood or saw-log section that meets pulpwood or saw-log specifications, respectively.

Miscellaneous Federal land.—Federal land other than National Forest land.

Miscellaneous private land.—Privately owned land other than forest-industry and farmer-owned land.

Mortality.—The volume of sound wood in growing-stock and sawtimber trees that die annually.

National Forest land.—Federal land that has been legally designated as National Forest or purchase units, and other land administered by the USDA Forest Service.

Net annual growth of growing stock.—The annual change in volume of sound wood in live sawtimber and poletimber trees and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes.

Net annual growth of sawtimber.—The annual change in the volume of live sawtimber trees and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes.

Net volume.—Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

Noncommercial species.—Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

Nonforest land.—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area to qualify as nonforest land.)

a. *Nonforest land without trees.*—Nonforest land with no live trees present.

b. *Nonforest land with trees.*—Nonforest land with one or more trees per acre at least 5 inches d.b.h.

Nonstocked land.—Timberland less than 16.7 percent stocked with growing-stock trees.

Other removals.—Growing-stock trees removed but not utilized for products, or trees left standing but “removed” from the timberland classification by land use change. Examples are removals from cultural operations such as timber stand improvement work, land clearing, and changes in land use.

Ownership size.—A classification of the amount of timberland owned by one owner, regardless of the number of parcels.

Owner tenure.—The length of time a property has been held by the owner.

Pasture.—Land presently used for grazing or under cultivation to develop grazing.

Pastured timberland.—Timberland for which the primary use is wood production, but is presently used for grazing.

Physiographic class.—A measure of soil and water conditions that affect tree growth on a site. The physiographic classes are:

Xeric sites.—Very dry soils where excessive drainage seriously limits both growth and species occurrence. Example: cedar barrens.

Xeromesic sites.—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

Mesic sites.—Deep, well-drained soils. Growth and species occurrence are limited only by climate.

Hydromesic sites.—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: better drained bottomland hardwood sites.

Hydric sites.—Very wet sites where excess water seriously limits both growth and species occurrence. Example: frequently flooded river bottoms and cypress swamps.

Plant byproducts.—Plant residues used for products such as mulch, pulp chips, and fuelwood.

Plant residues.—Wood and bark materials generated at manufacturing plants during production of other products.

Poletimber stand.—(See Stand-size class.)

Poletimber tree.—A growing-stock tree of commercial species at least 5 inches d.b.h. but smaller than sawtimber size.

Reserved timberland.—Forest land sufficiently productive to qualify as timberland but withdrawn from timber utilization through statute, administrative regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

Rotten trees.—Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in a tree is rotten.

Rough trees.—(a) Live trees of commercial species that do not contain at least one merchantable 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all live trees of noncommercial species.

Roundwood products.—Logs, bolts, or other round sections (including chips from roundwood) cut from trees for industrial or consumer uses. (Note: Includes saw logs, veneer logs, and bolts; cooperage logs and bolts; pulpwood; fuelwood; piling; poles; posts; hewn ties; mine timbers; and various other round, split, or hewn products.)

Salvable dead tree.—A standing or down dead tree considered merchantable by regional standards.

Sapling.—A live tree 1 to 5 inches d.b.h.

Sapling-seedling stand.—(See Stand-size class.)

Saw log.—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight and with a minimum diameter outside bark (d.o.b.) for softwoods of 7 inches (9 inches for hardwoods) or other combinations of size and defect specified by regional standards.

Saw-log portion.—That part of the bole of sawtimber trees between the stump and the saw-log top.

Saw-log top.—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw-log top is 7 inches d.o.b. for softwoods and 9 inches d.o.b. for hardwoods.

Sawtimber stand.—(See Stand-size class.)

Sawtimber tree.—A growing-stock tree of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting regional specifications for freedom from defect. Softwoods must be at least 9 inches d.b.h. Hardwoods must be at least 11 inches d.b.h.

Sawtimber volume.—Net volume of the saw-log portion of live sawtimber in board feet, International 1/4-inch rule (unless specified otherwise) from stump to a minimum 7 inches top diameter outside bark (d.o.b.) for softwoods and a minimum 9 inches top d.o.b. for hardwoods.

Seedling.—A live tree less than 1 inch d.b.h. that is expected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

Short-log (rough tree).—Sawtimber-size trees of commercial species that contain at least one merchantable 8- to 11-foot saw log but not a 12-foot saw log.

Site class.—A classification of forest lands in terms of inherent capacity to grow crops of industrial wood. The class identifies the potential growth in merchantable cubic feet/acre/year at culmination of mean annual increment of fully stocked natural stands.

Site index.—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

Soft hardwoods.—Hardwood species with an average specific gravity of 0.50 or less such as gum, yellow-poplar, cottonwood, red maple, basswood, and willow.

Softwoods.—Coniferous trees, usually evergreen, having needles or scale-like leaves.

Stand.—A group of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

Stand-age class.—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

Stand-area class.—The extent of a continuous forested area of the same forest type, stand-size class, and stand-density class.

Stand-size class.—A classification of stocked (see stocking) forest land based on the size class of live trees on the area; that is, sawtimber, poletimber, or seedlings and saplings.

Sawtimber stands.—Stands with half or more of live stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.—Stands with half or more live stocking in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands.—Stands with more than half of the live stocking in saplings and/or seedlings.

State land.—Land owned by States or leased to them for 50 years or more.

Stocking.—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5 inches d.b.h.

Stands are grouped into the following stocking classes:

Overstocked stands.—Stands in which stocking of trees is 130 percent or more.

Fully stocked stands.—Stands in which stocking of trees is from 100.0 to 129.9 percent.

Medium stocked stands.—Stands in which stocking of trees is from 60.0 to 99.9 percent.

Poorly stocked stands.—Stands in which stocking of trees is from 16.7 to 59.9 percent.

Nonstocked areas.—Commercial forest land on which stocking of trees is less than 16.7 percent.

Timberland.—Forest land that is producing or capable of producing in excess of 20 cubic feet per acre per year of industrial wood crops under natural conditions, that is not withdrawn from timber utilization, and that is not associated with urban or rural development. Currently inaccessible and inoperable areas are included.

Timber removals from growing stock.—The net volume of growing stock in growing-stock trees removed for forest products (including roundwood products and logging residues) and for other uses (see Other removals). Timber removals from growing stock are reported for a single year and are based on information obtained from a survey of primary wood-using mills (see Survey Procedures in Appendix).

Timber removals from sawtimber.—The net board-foot volume of live sawtimber trees removed for forest products (including roundwood products and logging residues) and for other uses (see Other removals). Timber removals from sawtimber are reported for a single year (1988 in this report) and are based on information obtained from a survey of primary wood-using mills (see Survey Procedures in Appendix).

Timber products output.—All timber products cut from roundwood and byproducts of wood manufacturing plants. Roundwood products include logs, bolts, or other round sections cut from growing-stock trees, cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edgings, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulpwood chips or other products.

Tree.—A woody plant usually having one or more perennial stems, a more or less definitely formed crown of foliage, and a height of at least 12 feet at maturity.

Tree biomass.—The total aboveground weight (including the bark) of all trees from 1 to 5 inches in d.b.h., and the total aboveground weight (including the bark) from a 1-foot stump for trees more than 5 inches in diameter.

Tree size class.—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

Upper stem portion.—That part of the bole of sawtimber trees above the saw log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

Urban and other areas.—Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial, or recreational purposes; school yards; cemeteries; or other nonforest land not included in any other specified land use class.

Urban forest land.—Forest land closely associated with or in such proximity to urban nonforest land uses that it is not likely to be managed for the production of industrial wood products on a continuing basis. Wood removed would be for land clearing, fuelwood, or aesthetic purposes. Such forest land may be associated with industrial, commercial, resi-

dential, or recreational nonforest uses. Residential subdivisions, industrial parks, golf course perimeters, airport buffer strips, and public urban parks that qualify as forest land are included.

Water.—Water Areas. Areas within a land mass persistently covered by water.

(a) *Bureau of the Census.*—Permanent inland water surfaces, such as lakes, reservoirs, and ponds at least 40 acres in area; and streams, sloughs, estuaries, and canals at least one-eighth of a statute mile wide. This is the same definition that the Soil Conservation Service uses in the National Resource Inventory. Bureau of the Census estimates of total water area were used in 1967; Soil Conservation Service estimates were used for 1986.

(b) *Noncensus.*—Permanent inland water surfaces, such as lakes, reservoirs, and ponds from 1 to 39.9 acres in area; and streams, sloughs, estuaries, and canals from 120 feet to one-eighth of a statute mile wide.

Windbreak.—A group of trees whose primary use is to protect buildings currently in use.

Wooded pasture.—Improved pasture with more than 16.7 percent stocking in live trees but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or there is other evidence of grazing.

Wooded strip.—An acre or more of natural continuous forest land that would otherwise meet survey standards for timberland except that it is less than 120 feet wide.

Woodland.—Forest land not capable of producing 20 cubic feet per acre per year of industrial wood crops under natural conditions and not associated with urban or rural development. These sites often contain tree species that are not currently utilized for industrial wood production or trees of poor form, small size, or inferior quality that are unfit for industrial products. Unproductivity may be the result of adverse site conditions such as sterile soil, dry climate, poor drainage, high elevation, and rockiness. This land is not withdrawn from timber utilization.

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¹³Tables 12-36 are core tables common to all Forest Inventory and Analysis statistical reports in the eastern United States. A larger group of tables reporting the results of the 1986 Indiana forest inventory is in: Smith and Golitz, 1988.

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Table 39.—Sampling errors for Forest Survey Unit and county totals of volume, net annual growth, average annual removals, and area of timberland

Table 12.--Area of land by county and major land use class, Indiana, 1986

| Unit and county | Land area | Forest land | | | Timberland as a percent of land area | Nonforest land with trees | Nonforest land as a percent of land area | Sampling error for timberland |
|-------------------|-----------|-----------------|---------------------|----------------|--------------------------------------|---------------------------|--|-------------------------------|
| | | All forest land | Reserved timberland | Timberland | | | | |
| | | Thousand acres | Thousand acres | Thousand acres | | | | |
| Lower Wabash Unit | | | | | | | | |
| Clay | 230.5 | 44.7 | 0.4 | 44.3 | 19.2 | 15.7 | 6.8 | 11.11 |
| Daviess | 276.6 | 42.1 | 0.5 | 41.6 | 15.0 | 9.9 | 3.6 | 11.46 |
| Gibson | 313.6 | 42.4 | 0.4 | 42.0 | 13.4 | 14.3 | 4.6 | 11.41 |
| Greene | 348.6 | 106.2 | 0.9 | 105.3 | 30.2 | 20.9 | 6.0 | 7.20 |
| Knox | 332.6 | 31.0 | 0.2 | 30.8 | 9.3 | 17.3 | 5.2 | 13.32 |
| Martin | 216.8 | 131.9 | 3.5 | 128.4 | 59.2 | 6.4 | 3.0 | 6.52 |
| Parke | 284.2 | 91.0 | 3.4 | 87.6 | 30.8 | 12.8 | 4.5 | 7.90 |
| Pike | 218.0 | 84.4 | 0.5 | 83.9 | 38.5 | 8.6 | 3.9 | 8.07 |
| Posey | 261.8 | 49.9 | 4.8 | 45.1 | 17.2 | 9.5 | 3.6 | 11.01 |
| Putnam | 308.4 | 76.7 | 0.2 | 76.5 | 24.8 | 16.0 | 5.2 | 8.45 |
| Sullivan | 287.8 | 65.5 | 0.8 | 64.7 | 22.5 | 9.9 | 3.4 | 9.19 |
| Vanderburgh | 151.1 | 25.7 | 1.0 | 24.7 | 16.3 | 18.7 | 12.4 | 14.87 |
| Vermillion | 166.4 | 35.0 | 0.3 | 34.7 | 20.9 | 6.2 | 3.7 | 12.55 |
| Vigo | 262.1 | 51.1 | 0.3 | 50.8 | 19.4 | 15.4 | 5.9 | 10.37 |
| Total | 3,658.5 | 877.6 | 17.2 | 860.4 | 23.5 | 181.6 | 5.0 | 2.52 |
| Knobs Unit | | | | | | | | |
| Brown | 199.2 | 150.0 | 18.4 | 131.6 | 66.1 | 10.4 | 5.2 | 3.02 |
| Clark | 240.8 | 85.9 | 1.0 | 84.9 | 35.3 | 14.2 | 5.9 | 3.76 |
| Crawford | 196.1 | 120.8 | 1.5 | 119.3 | 60.8 | 7.8 | 4.0 | 3.17 |
| Dubois | 274.8 | 93.8 | 0.8 | 93.0 | 33.8 | 15.2 | 5.5 | 3.59 |
| Floyd | 95.8 | 34.9 | 0.4 | 34.5 | 36.0 | 14.2 | 14.8 | 5.90 |
| Harrison | 311.0 | 135.2 | 3.1 | 132.1 | 42.5 | 17.1 | 5.5 | 3.01 |
| Jackson | 327.8 | 125.2 | 4.6 | 120.6 | 36.8 | 17.2 | 5.2 | 3.15 |
| Lawrence | 289.3 | 126.8 | 1.5 | 125.3 | 43.3 | 15.4 | 5.3 | 3.09 |
| Monroe | 246.4 | 130.8 | 13.3 | 117.5 | 47.7 | 13.3 | 5.4 | 3.20 |
| Morgan | 261.6 | 88.2 | 1.5 | 86.7 | 33.1 | 18.3 | 7.0 | 3.72 |
| Orange | 254.7 | 131.5 | 2.4 | 129.1 | 50.7 | 13.3 | 5.2 | 3.05 |
| Owen | 247.1 | 110.3 | 2.8 | 107.5 | 43.5 | 15.7 | 6.4 | 3.34 |
| Perry | 244.2 | 153.8 | 1.3 | 152.5 | 62.4 | 9.7 | 4.0 | 2.80 |
| Scott | 122.5 | 45.6 | 2.6 | 43.0 | 35.1 | 6.9 | 5.6 | 5.28 |
| Spencer | 256.2 | 65.0 | 2.5 | 62.5 | 24.4 | 14.8 | 5.8 | 4.38 |
| Warrick | 250.4 | 84.0 | 2.6 | 81.4 | 32.5 | 16.8 | 6.7 | 3.84 |
| Washington | 330.2 | 123.5 | 3.9 | 119.6 | 36.2 | 23.0 | 7.0 | 3.17 |
| Total | 4,148.1 | 1,805.3 | 64.2 | 1,741.1 | 42.0 | 243.3 | 5.9 | .83 |
| Upland Flats Unit | | | | | | | | |
| Dearborn | 196.7 | 91.1 | -- | 91.1 | 46.3 | 12.6 | 6.4 | 8.86 |
| Fayette | 137.8 | 33.6 | 0.1 | 33.5 | 24.3 | 8.5 | 6.2 | 14.62 |
| Franklin | 246.9 | 82.2 | 1.8 | 80.4 | 32.6 | 17.4 | 7.0 | 9.43 |
| Jefferson | 232.0 | 87.3 | 9.0 | 78.3 | 33.8 | 19.7 | 8.5 | 9.56 |
| Jennings | 241.8 | 95.7 | 8.1 | 87.6 | 36.2 | 15.0 | 6.2 | 9.04 |
| Ohio | 55.8 | 27.9 | -- | 27.9 | 50.0 | 3.6 | 6.5 | 16.02 |
| Ripley | 286.3 | 88.8 | 13.1 | 75.7 | 26.4 | 25.9 | 9.0 | 9.72 |
| Switzerland | 143.1 | 75.7 | 0.5 | 75.2 | 52.6 | 8.9 | 6.2 | 9.76 |
| Union | 104.0 | 21.9 | 0.5 | 21.4 | 20.6 | 6.7 | 6.4 | 18.29 |
| Total | 1,644.4 | 604.2 | 33.1 | 571.1 | 34.7 | 118.3 | 7.2 | 3.54 |

(Table 12 continued on next page)

(Table 12 continued)

| Unit and county | Forest land | | | | Timberland as a percent of land area | Nonforest land with trees | Nonforest land as a percent of land area | Sampling error for timberland |
|-----------------|--------------|-----------------------|------------------------|------------|--|---------------------------------|---|-------------------------------------|
| | Land area | All forest land | Reserved timberland | Timberland | | | | |
| | | Thousand acres | | | Percent | Thousand acres | Percent | Percent |
| Northern Unit | | | | | | | | |
| Adams | 217.5 | 14.2 | 0.1 | 14.1 | 6.5 | 2.1 | 1.0 | 21.78 |
| Allen | 421.7 | 30.5 | 0.7 | 29.8 | 7.1 | 23.8 | 5.6 | 14.98 |
| Bartholomew | 261.5 | 47.1 | 2.3 | 44.8 | 17.1 | 6.9 | 2.6 | 12.22 |
| Benton | 260.2 | 1.5 | -- | 1.5 | 0.6 | 0.4 | 0.2 | 66.77 |
| Blackford | 106.0 | 9.4 | -- | 9.4 | 8.9 | 1.3 | 1.2 | 26.67 |
| Boone | 271.0 | 15.3 | 0.1 | 15.2 | 5.6 | 4.1 | 1.5 | 20.97 |
| Carroll | 238.1 | 18.5 | 0.1 | 18.4 | 7.7 | 6.1 | 2.6 | 19.06 |
| Cass | 265.1 | 24.3 | 0.1 | 24.2 | 9.1 | 5.8 | 2.2 | 16.62 |
| Clinton | 259.3 | 9.3 | 0.1 | 9.2 | 3.5 | 2.4 | 0.9 | 26.96 |
| Decatur | 238.6 | 24.3 | 0.2 | 24.1 | 10.1 | 3.4 | 1.4 | 16.66 |
| De Kalb | 232.4 | 27.4 | 0.1 | 27.3 | 11.7 | 5.9 | 2.5 | 15.65 |
| Delaware | 250.8 | 15.9 | 0.1 | 15.8 | 6.3 | 4.6 | 1.8 | 20.57 |
| Elkhart | 298.4 | 29.4 | 0.3 | 29.1 | 9.7 | 8.4 | 2.8 | 15.16 |
| Fountain | 254.6 | 37.4 | 0.8 | 36.6 | 14.4 | 8.4 | 3.3 | 13.52 |
| Fulton | 236.3 | 20.5 | 0.1 | 20.4 | 8.6 | 5.1 | 2.2 | 18.11 |
| Grant | 265.5 | 18.3 | 0.1 | 18.2 | 6.9 | 4.6 | 1.7 | 19.17 |
| Hamilton | 255.0 | 20.4 | 0.4 | 20.0 | 7.8 | 5.3 | 2.1 | 18.29 |
| Hancock | 196.5 | 11.9 | 0.1 | 11.8 | 6.0 | 4.9 | 2.5 | 23.81 |
| Hendricks | 261.7 | 17.8 | 0.1 | 17.7 | 6.8 | 5.1 | 1.9 | 19.44 |
| Henry | 251.8 | 20.7 | 0.1 | 20.6 | 8.2 | 8.4 | 3.3 | 18.02 |
| Howard | 187.6 | 8.7 | 0.1 | 8.6 | 4.6 | 7.4 | 3.9 | 27.88 |
| Huntington | 234.4 | 23.1 | 0.2 | 22.9 | 9.8 | 5.3 | 2.3 | 17.09 |
| Jasper | 359.0 | 27.9 | 0.9 | 27.0 | 7.5 | 6.6 | 1.8 | 15.74 |
| Jay | 245.8 | 24.1 | 0.1 | 24.0 | 9.8 | 3.0 | 1.2 | 16.69 |
| Johnson | 205.8 | 20.2 | 0.1 | 20.1 | 9.8 | 5.7 | 2.8 | 18.24 |
| Kosciusko | 345.2 | 33.1 | 0.1 | 33.0 | 9.6 | 5.8 | 1.7 | 14.24 |
| La Grange | 243.2 | 36.0 | 0.1 | 35.9 | 14.8 | 10.6 | 4.4 | 13.65 |
| Lake | 320.5 | 18.5 | 0.7 | 17.8 | 5.6 | 11.5 | 3.6 | 19.38 |
| La Porte | 384.2 | 42.2 | 0.8 | 41.4 | 10.8 | 11.2 | 2.9 | 12.71 |
| Madison | 289.8 | 13.1 | 0.1 | 13.0 | 4.5 | 4.4 | 1.5 | 22.68 |
| Marion | 252.9 | 1.9 | 1.0 | 0.9 | 0.4 | 53.3 | 21.1 | 86.20 |
| Marshall | 284.3 | 31.1 | 0.1 | 31.0 | 10.9 | 6.5 | 2.3 | 14.69 |
| Miami | 240.9 | 25.5 | 0.1 | 25.4 | 10.5 | 4.1 | 1.7 | 16.23 |
| Montgomery | 323.1 | 25.7 | 1.7 | 24.0 | 7.4 | 7.2 | 2.2 | 16.69 |
| Newton | 256.6 | 19.5 | 1.6 | 17.9 | 7.0 | 2.1 | 0.8 | 19.33 |
| Noble | 264.0 | 33.6 | 1.3 | 32.3 | 12.2 | 7.9 | 3.0 | 14.39 |
| Porter | 267.7 | 37.9 | 7.3 | 30.6 | 11.4 | 13.6 | 5.1 | 14.78 |
| Pulaski | 278.1 | 29.3 | 2.3 | 27.0 | 9.7 | 5.7 | 2.0 | 15.74 |
| Randolph | 290.2 | 19.8 | 0.1 | 19.7 | 6.8 | 4.2 | 1.4 | 18.42 |
| Rush | 261.2 | 12.6 | 0.2 | 12.4 | 4.7 | 7.4 | 2.8 | 23.22 |
| St. Joseph | 293.9 | 23.3 | 0.8 | 22.5 | 7.7 | 10.3 | 3.5 | 17.24 |
| Shelby | 264.0 | 12.6 | 0.1 | 12.5 | 4.7 | 2.1 | 0.8 | 23.13 |
| Starke | 198.0 | 27.1 | 0.2 | 26.9 | 13.6 | 6.9 | 3.5 | 15.77 |
| Steuben | 196.8 | 32.5 | 1.0 | 31.5 | 16.0 | 7.9 | 4.0 | 14.57 |
| Tippecanoe | 321.1 | 22.8 | 0.2 | 22.6 | 7.0 | 7.8 | 2.4 | 17.20 |
| Tipton | 166.6 | 4.8 | 0.1 | 4.7 | 2.8 | 4.2 | 2.5 | 37.72 |
| Wabash | 265.6 | 24.2 | 0.2 | 24.0 | 9.0 | 8.9 | 3.4 | 16.69 |
| Warren | 234.5 | 23.9 | 0.1 | 23.8 | 10.1 | 5.8 | 2.5 | 16.76 |
| Wayne | 258.3 | 32.0 | 0.1 | 31.9 | 12.3 | 17.1 | 6.6 | 14.48 |
| Wells | 236.9 | 17.3 | 1.1 | 16.2 | 6.8 | 3.4 | 1.4 | 20.32 |
| White | 324.0 | 13.1 | 0.1 | 13.0 | 4.0 | 4.9 | 1.5 | 22.68 |
| Whitley | 214.9 | 20.6 | 0.1 | 20.5 | 9.5 | 5.0 | 2.3 | 18.06 |
| Total | 13,551.1 | 1,152.1 | 28.9 | 1,123.2 | 8.3 | 384.8 | 2.8 | 2.44 |
| All counties | 23,002.1 | 4,439.2 | 143.4 | 4,295.8 | 18.7 | 928.0 | 4.0 | 1.00 |

Table 13.--Area of timberland by county and ownership class, Indiana, 1986

(In thousand acres)

| Unit and county | Ownership class | | | | | | | | |
|--------------------------|-----------------|-----------------|---------------|-------|--------------------|-----------------|--------|---------------------|----------------------|
| | All owners | National forest | Misc. federal | State | County & municipal | Forest industry | Farmer | Misc. private-corp. | Misc. private-indiv. |
| Lower Wabash Unit | | | | | | | | | |
| Clay | 44.3 | -- | 2.9 | -- | 0.6 | -- | 17.4 | 6.8 | 16.6 |
| Daviess | 41.6 | -- | 2.6 | 3.6 | 0.4 | 0.2 | 13.8 | 6.7 | 14.3 |
| Gibson | 42.0 | -- | 1.9 | 0.2 | 0.5 | -- | 17.5 | 6.4 | 15.5 |
| Greene | 105.3 | -- | 7.1 | 4.5 | 0.9 | -- | 37.1 | 18.4 | 37.3 |
| Knox | 30.8 | -- | 2.0 | 0.4 | 0.4 | -- | 13.0 | 1.9 | 13.1 |
| Martin | 128.4 | 9.0 | 12.7 | 7.6 | 1.0 | 1.1 | 40.5 | 15.2 | 41.3 |
| Parke | 87.6 | -- | 3.5 | 0.3 | 0.9 | 0.7 | 33.2 | 15.3 | 33.7 |
| Pike | 83.9 | -- | 5.0 | 4.0 | 0.7 | -- | 28.5 | 15.7 | 30.0 |
| Posey | 45.1 | -- | 3.1 | 1.7 | 0.5 | -- | 17.1 | 5.9 | 16.8 |
| Putnam | 76.5 | -- | 6.7 | 2.1 | 1.0 | 0.1 | 29.2 | 3.7 | 33.7 |
| Sullivan | 64.7 | -- | 4.3 | 4.9 | 0.5 | -- | 20.6 | 11.6 | 22.8 |
| Vanderburgh | 24.7 | -- | 1.3 | -- | 0.3 | -- | 10.2 | 2.3 | 10.6 |
| Vermillion | 34.7 | -- | 3.1 | -- | 0.2 | -- | 14.1 | 4.1 | 13.2 |
| Vigo | 50.8 | -- | 3.0 | 0.2 | 0.4 | -- | 20.3 | 8.9 | 18.0 |
| Total | 860.4 | 9.0 | 59.2 | 29.5 | 8.3 | 2.1 | 312.5 | 122.9 | 316.9 |
| Knobs Unit | | | | | | | | | |
| Brown | 131.6 | 14.4 | 10.3 | 23.3 | 0.3 | 2.1 | 29.8 | 9.3 | 42.1 |
| Clark | 84.9 | -- | 4.1 | 15.9 | 0.3 | -- | 23.7 | 7.7 | 33.2 |
| Crawford | 119.3 | 19.5 | 8.3 | 12.6 | 0.3 | 2.4 | 27.2 | 8.2 | 40.8 |
| Dubois | 93.0 | 0.3 | 6.2 | 4.5 | 0.3 | 0.1 | 30.8 | 9.8 | 41.0 |
| Floyd | 34.5 | -- | -- | -- | 0.1 | 0.2 | 14.5 | 4.3 | 15.4 |
| Harrison | 132.1 | -- | -- | 13.9 | 0.5 | 1.0 | 41.4 | 11.7 | 63.6 |
| Jackson | 120.6 | 20.0 | 4.1 | 6.9 | 0.5 | 0.3 | 32.7 | 9.2 | 46.9 |
| Lawrence | 125.3 | 14.9 | 2.1 | -- | 0.3 | 0.6 | 39.3 | 12.5 | 55.6 |
| Monroe | 117.5 | 8.0 | 8.3 | 18.9 | 0.3 | 0.6 | 30.6 | 9.2 | 41.6 |
| Morgan | 86.7 | -- | -- | 5.2 | 0.6 | 1.1 | 28.5 | 8.3 | 43.0 |
| Orange | 129.1 | 26.0 | 12.4 | 1.3 | 0.4 | 0.7 | 31.5 | 8.9 | 47.9 |
| Owen | 107.5 | -- | 6.2 | 5.5 | 0.2 | 0.4 | 40.8 | 11.9 | 42.5 |
| Perry | 152.5 | 53.9 | -- | 3.4 | 0.3 | 2.6 | 32.6 | 10.3 | 49.4 |
| Scott | 43.0 | -- | -- | 5.3 | 0.3 | -- | 13.4 | 4.1 | 19.9 |
| Spencer | 62.5 | -- | -- | -- | 0.4 | 0.2 | 22.4 | 6.7 | 32.8 |
| Warrick | 81.4 | -- | -- | -- | 0.5 | 0.5 | 30.2 | 8.9 | 41.3 |
| Washington | 119.6 | -- | -- | 12.6 | 0.3 | 0.7 | 45.1 | 13.6 | 47.3 |
| Total | 1,741.1 | 157.0 | 62.0 | 129.3 | 5.9 | 13.5 | 514.5 | 154.6 | 704.3 |
| Upland Flats Unit | | | | | | | | | |
| Dearborn | 91.1 | -- | 2.2 | 0.3 | 0.5 | -- | 46.6 | 5.2 | 36.3 |
| Fayette | 33.5 | -- | 0.8 | 0.1 | 0.4 | -- | 16.7 | 1.3 | 14.2 |
| Franklin | 80.4 | -- | 1.8 | 0.2 | 0.6 | -- | 38.6 | 3.6 | 35.6 |
| Jefferson | 78.3 | -- | 2.0 | 0.1 | 0.1 | -- | 36.3 | 2.8 | 37.0 |
| Jennings | 87.6 | -- | 1.6 | 6.9 | 0.6 | -- | 38.1 | 5.0 | 35.4 |
| Ohio | 27.9 | -- | 0.7 | -- | 0.2 | -- | 14.3 | 1.5 | 11.2 |
| Ripley | 75.7 | -- | 2.0 | -- | 0.1 | -- | 33.1 | 2.5 | 38.0 |
| Switzerland | 75.2 | -- | 1.8 | -- | 0.1 | -- | 37.6 | 3.6 | 32.1 |
| Union | 21.4 | -- | 0.6 | -- | 0.1 | -- | 10.0 | 1.0 | 9.7 |
| Total | 571.1 | -- | 13.5 | 7.6 | 2.7 | -- | 271.3 | 26.5 | 249.5 |

(Table 13 continued on next page)

(Table 13 continued)

| Unit and county | Ownership class | | | | | | | | |
|-----------------|-----------------|-----------------|---------------|-------|--------------------|-----------------|---------|---------------------|----------------------|
| | All owners | National forest | Misc. federal | State | County & municipal | Forest industry | Farmer | Misc. private-corp. | Misc. private-indiv. |
| Northern Unit | | | | | | | | | |
| Adams | 14.1 | -- | 0.3 | -- | 0.1 | 0.1 | 7.9 | 1.3 | 4.4 |
| Allen | 29.8 | -- | 0.4 | -- | 0.3 | 0.2 | 15.0 | 3.1 | 10.8 |
| Bartholomew | 44.8 | -- | 1.0 | 0.1 | 0.4 | 0.1 | 24.8 | 4.5 | 13.9 |
| Benton | 1.5 | -- | 0.0 | -- | -- | -- | 0.8 | 0.2 | 0.5 |
| Blackford | 9.4 | -- | 0.2 | -- | 0.1 | -- | 5.3 | 0.9 | 2.9 |
| Boone | 15.2 | -- | 0.4 | -- | 0.1 | -- | 8.1 | 1.6 | 5.0 |
| Carroll | 18.4 | -- | 0.3 | 0.1 | 0.2 | -- | 10.0 | 1.7 | 6.1 |
| Cass | 24.2 | -- | 0.5 | -- | 0.3 | 0.2 | 13.6 | 2.0 | 7.6 |
| Clinton | 9.2 | -- | 0.2 | -- | 0.1 | -- | 5.0 | 0.9 | 3.0 |
| Decatur | 24.1 | -- | 0.5 | -- | 0.2 | -- | 13.5 | 2.3 | 7.6 |
| De Kalb | 27.3 | -- | 0.9 | -- | 0.3 | 0.3 | 15.3 | 2.2 | 8.3 |
| Delaware | 15.8 | -- | 0.4 | -- | 0.2 | -- | 8.3 | 1.6 | 5.3 |
| Elkhart | 29.1 | -- | 0.6 | -- | 0.3 | -- | 16.4 | 2.4 | 9.4 |
| Fountain | 36.6 | -- | 1.0 | -- | 0.4 | -- | 21.2 | 2.9 | 11.1 |
| Fulton | 20.4 | -- | 0.5 | 0.1 | 0.2 | 0.3 | 11.1 | 1.8 | 6.4 |
| Grant | 18.2 | -- | 0.4 | -- | 0.2 | -- | 10.3 | 1.6 | 5.7 |
| Hamilton | 20.0 | -- | 0.5 | -- | 0.3 | -- | 11.0 | 1.7 | 6.5 |
| Hancock | 11.8 | -- | 0.3 | -- | 0.2 | -- | 6.6 | 0.9 | 3.8 |
| Hendricks | 17.7 | -- | 0.4 | -- | 0.2 | -- | 9.5 | 1.8 | 5.8 |
| Henry | 20.6 | -- | 0.6 | 0.3 | 0.3 | 0.1 | 10.6 | 1.9 | 6.8 |
| Howard | 8.6 | -- | 0.1 | -- | 0.1 | -- | 4.0 | 1.1 | 3.3 |
| Huntington | 22.9 | -- | 0.5 | 0.1 | 0.2 | -- | 13.0 | 2.0 | 7.1 |
| Jasper | 27.0 | -- | 0.6 | 1.4 | 0.3 | -- | 13.5 | 2.5 | 8.7 |
| Jay | 24.0 | -- | 0.5 | -- | 0.1 | -- | 13.8 | 2.3 | 7.3 |
| Johnson | 20.1 | -- | 0.4 | 0.5 | 0.2 | -- | 10.4 | 2.0 | 6.6 |
| Kosciusko | 33.0 | -- | 0.6 | 0.6 | 0.2 | 0.4 | 17.9 | 3.2 | 10.1 |
| La Grange | 35.9 | -- | 1.9 | 0.7 | 0.5 | -- | 18.1 | 3.5 | 11.2 |
| Lake | 17.8 | -- | 0.5 | 0.1 | 0.2 | -- | 9.8 | 1.6 | 5.6 |
| La Porte | 41.4 | -- | 1.1 | 1.0 | 0.4 | 0.1 | 21.9 | 3.8 | 13.1 |
| Madison | 13.0 | -- | 0.2 | -- | 0.1 | -- | 7.4 | 1.2 | 4.1 |
| Marion | 0.9 | -- | 0.0 | -- | -- | -- | 0.3 | 0.1 | 0.5 |
| Marshall | 31.0 | -- | 0.9 | 0.1 | 0.2 | 0.2 | 17.2 | 2.8 | 9.6 |
| Miami | 25.4 | -- | 0.5 | 0.1 | 0.2 | 0.2 | 14.2 | 2.4 | 7.8 |
| Montgomery | 24.0 | -- | 0.5 | -- | 0.3 | -- | 13.0 | 2.1 | 8.1 |
| Newton | 17.9 | -- | 0.4 | 2.0 | 0.2 | -- | 8.3 | 1.6 | 5.4 |
| Noble | 32.3 | -- | 0.9 | 0.3 | 0.3 | 0.1 | 17.2 | 3.0 | 10.5 |
| Porter | 30.6 | -- | 1.0 | 0.1 | 0.5 | -- | 16.1 | 2.8 | 10.1 |
| Pulaski | 27.0 | -- | 0.6 | 1.2 | 0.3 | 0.1 | 13.9 | 2.3 | 8.6 |
| Randolph | 19.7 | -- | 0.4 | -- | 0.1 | 0.2 | 10.8 | 1.8 | 6.4 |
| Rush | 12.4 | -- | 0.2 | -- | 0.2 | -- | 6.1 | 1.3 | 4.6 |
| St. Joseph | 22.5 | -- | 0.6 | -- | 0.3 | -- | 12.5 | 1.9 | 7.2 |
| Shelby | 12.5 | -- | 0.3 | -- | 0.1 | -- | 7.0 | 1.2 | 3.9 |
| Starke | 26.9 | -- | 0.5 | 1.0 | 0.3 | -- | 14.2 | 2.2 | 8.7 |
| Steuben | 31.5 | -- | 0.9 | 0.9 | 0.4 | 0.2 | 15.8 | 3.0 | 10.3 |
| Tippecanoe | 22.6 | -- | 0.5 | -- | 0.3 | -- | 12.3 | 1.9 | 7.6 |
| Tipton | 4.7 | -- | 0.1 | -- | 0.1 | -- | 2.1 | 0.5 | 1.9 |
| Wabash | 24.0 | -- | 0.8 | 0.3 | 0.3 | -- | 12.3 | 2.3 | 8.0 |
| Warren | 23.8 | -- | 0.5 | -- | 0.2 | -- | 13.2 | 2.2 | 7.7 |
| Wayne | 31.9 | -- | 1.0 | -- | 0.4 | -- | 17.7 | 2.8 | 10.0 |
| Wells | 16.2 | -- | 0.4 | -- | 0.2 | -- | 8.9 | 1.5 | 5.2 |
| White | 13.0 | -- | 0.5 | -- | 0.2 | -- | 6.8 | 1.2 | 4.3 |
| Whitley | 20.5 | -- | 0.6 | -- | 0.2 | -- | 11.6 | 1.7 | 6.4 |
| Total | 1,123.2 | -- | 27.9 | 11.0 | 12.0 | 2.8 | 605.6 | 103.1 | 360.8 |
| All counties | 4,295.8 | 166.0 | 162.6 | 177.4 | 28.9 | 18.4 | 1,703.9 | 407.1 | 1,631.5 |

Table 14.--Area of timberland by county and forest type, Indiana, 1986

(In thousand acres)

| Unit and County | All types | Forest type | | | | | | | | | | | | | |
|-------------------|-----------|---------------------|----------------|----------------------|----------|-------------|----------------------|---------------------|---------|-------------|--------------------|-------------|-------------|--------------------------|-------------|
| | | Jack-red-white pine | Shortleaf pine | Scotch-Virginia pine | Oak-pine | Oak-hickory | Chestnut-scarlet oak | Sassafras-persimmon | Oak-gum | Lowland oak | Elm-ash-soft maple | Cotton-wood | Maple-beech | Cherry-ash-yellow-poplar | Non-stocked |
| Lower Wabash Unit | | | | | | | | | | | | | | | |
| Clay | 44.3 | 1.2 | 0.2 | 1.3 | 0.1 | 14.1 | -- | 0.1 | 0.7 | 0.6 | 11.3 | 0.4 | 7.7 | 6.5 | 0.1 |
| Daviess | 41.6 | 0.4 | 0.3 | 1.1 | 0.1 | 14.5 | -- | 0.4 | 0.4 | 0.4 | 11.1 | 0.4 | 7.3 | 5.0 | 0.2 |
| Gibson | 42.0 | 0.5 | 0.2 | 1.3 | 0.2 | 13.9 | -- | 0.4 | 0.4 | 0.5 | 11.2 | 0.5 | 7.0 | 5.7 | 0.2 |
| Greene | 105.3 | 2.3 | 0.5 | 2.8 | 0.4 | 33.9 | -- | 1.3 | 1.6 | 0.9 | 28.4 | 1.4 | 18.7 | 12.9 | 0.2 |
| Knox | 30.8 | 0.1 | 0.1 | 0.8 | -- | 10.4 | -- | 0.2 | -- | 0.4 | 7.9 | 0.1 | 5.5 | 5.1 | 0.2 |
| Martin | 128.4 | 0.1 | 0.6 | 0.6 | -- | 50.1 | -- | 0.9 | 0.6 | 1.0 | 31.4 | 0.1 | 27.4 | 15.5 | 0.1 |
| Parke | 87.6 | 1.6 | 0.3 | 1.9 | 0.5 | 30.0 | -- | 0.5 | 1.2 | 0.8 | 23.0 | 1.3 | 14.8 | 11.6 | 0.1 |
| Pike | 83.9 | 1.2 | 0.5 | 1.8 | 0.4 | 28.1 | -- | 1.0 | 1.0 | 0.7 | 22.9 | 1.0 | 15.1 | 10.1 | 0.1 |
| Posey | 45.1 | 0.4 | -- | 0.8 | 0.1 | 16.5 | -- | 0.2 | 0.4 | 0.5 | 11.4 | 0.3 | 8.3 | 6.0 | 0.2 |
| Putnam | 76.5 | 0.1 | -- | 0.8 | -- | 26.6 | -- | 0.2 | 0.1 | 1.0 | 18.8 | -- | 15.6 | 13.1 | 0.2 |
| Sullivan | 64.7 | 1.1 | 0.2 | 1.4 | 0.2 | 22.0 | -- | 1.0 | 0.9 | 0.5 | 17.7 | 0.6 | 11.5 | 7.4 | 0.2 |
| Vanderburgh | 24.7 | 0.2 | 0.1 | 0.6 | 0.1 | 8.1 | -- | 0.1 | 0.1 | 0.3 | 6.1 | 0.1 | 4.6 | 4.2 | 0.1 |
| Vermillion | 34.7 | 0.2 | 0.1 | 0.6 | -- | 11.9 | -- | 0.6 | 0.2 | 0.2 | 9.3 | 0.1 | 6.9 | 4.5 | 0.1 |
| Vigo | 50.8 | 0.5 | 0.6 | 1.5 | 0.2 | 16.0 | -- | 0.5 | 0.5 | 0.5 | 13.9 | 0.4 | 9.0 | 7.1 | 0.1 |
| Total | 860.4 | 9.9 | 3.7 | 17.3 | 2.3 | 296.1 | -- | 7.4 | 8.1 | 8.3 | 224.4 | 6.7 | 159.4 | 114.7 | 2.1 |
| Knobs Unit | | | | | | | | | | | | | | | |
| Brown | 131.6 | 2.0 | 2.3 | 3.0 | 4.3 | 53.9 | 4.6 | 0.5 | 1.6 | 0.1 | 13.7 | 0.1 | 30.8 | 14.4 | 0.3 |
| Clark | 84.9 | 1.7 | 1.0 | 2.9 | 3.3 | 30.9 | 1.9 | 0.7 | 1.4 | 0.2 | 11.2 | 0.1 | 19.1 | 10.0 | 0.5 |
| Crawford | 119.3 | 4.4 | 1.7 | 1.4 | 3.1 | 50.2 | 2.6 | 0.4 | 1.7 | 0.2 | 12.8 | 0.2 | 26.4 | 13.7 | 0.5 |
| Dubois | 93.0 | 1.0 | 0.3 | 3.5 | 3.1 | 34.6 | 1.8 | 0.9 | 1.2 | -- | 10.7 | -- | 25.3 | 10.2 | 0.4 |
| Floyd | 34.5 | 0.2 | 0.1 | 0.8 | 1.2 | 12.7 | 0.2 | 0.1 | 0.3 | -- | 4.1 | -- | 10.7 | 3.9 | 0.2 |
| Harrison | 132.1 | 1.9 | 0.5 | 4.9 | 4.7 | 50.0 | 3.4 | 1.0 | 2.5 | 0.4 | 16.9 | 0.7 | 28.3 | 16.3 | 0.6 |
| Jackson | 120.6 | 2.1 | 1.4 | 2.9 | 2.9 | 50.3 | 4.5 | 1.4 | 2.2 | 0.2 | 14.5 | 0.8 | 21.9 | 14.9 | 0.6 |
| Lawrence | 125.3 | 1.3 | 0.3 | 2.2 | 3.0 | 54.4 | 3.0 | 1.0 | 1.2 | -- | 11.6 | 0.2 | 32.5 | 14.1 | 0.5 |
| Monroe | 117.5 | 1.0 | 0.6 | 2.6 | 2.8 | 48.4 | 2.9 | 0.9 | 1.5 | -- | 12.8 | 0.2 | 30.2 | 13.2 | 0.4 |
| Morgan | 86.7 | 1.3 | 0.2 | 2.0 | 2.7 | 32.8 | 2.2 | 0.6 | 1.7 | 0.3 | 12.2 | 0.2 | 18.8 | 10.9 | 0.8 |
| Orange | 129.1 | 3.3 | 2.5 | 1.8 | 4.1 | 54.7 | 2.8 | 0.7 | 2.1 | 0.3 | 13.5 | 0.5 | 25.6 | 15.7 | 1.5 |
| Owen | 107.5 | 0.7 | 0.1 | 3.0 | 4.0 | 38.6 | 0.9 | 0.5 | 1.6 | -- | 14.2 | -- | 31.4 | 12.1 | 0.4 |
| Perry | 152.5 | 4.9 | 7.8 | 1.9 | 4.7 | 70.5 | 4.3 | 0.6 | 1.5 | 0.2 | 12.5 | 0.2 | 25.7 | 16.9 | 0.8 |
| Scott | 43.0 | 0.6 | 0.2 | 1.6 | 1.3 | 15.7 | 1.0 | 0.4 | 0.7 | -- | 5.8 | 0.2 | 9.7 | 5.4 | 0.4 |
| Spencer | 62.5 | 0.8 | 0.1 | 2.9 | 1.8 | 22.4 | 1.3 | 0.9 | 1.2 | -- | 8.5 | 0.3 | 13.8 | 7.8 | 0.7 |
| Warrick | 81.4 | 1.2 | 0.5 | 3.2 | 2.6 | 27.1 | 1.6 | 1.0 | 1.9 | 0.2 | 13.2 | 0.7 | 16.8 | 10.8 | 0.6 |
| Washington | 119.6 | 1.4 | 0.6 | 5.1 | 4.6 | 42.0 | 0.7 | 0.8 | 1.3 | -- | 14.4 | -- | 35.2 | 13.0 | 0.5 |
| Total | 1,741.1 | 29.8 | 20.2 | 45.7 | 54.2 | 689.2 | 39.7 | 12.4 | 25.6 | 2.1 | 202.6 | 4.4 | 402.2 | 203.3 | 9.7 |
| Upland Flats Unit | | | | | | | | | | | | | | | |
| Dearborn | 91.1 | -- | -- | 0.6 | 6.6 | 18.4 | -- | -- | 2.5 | -- | 16.5 | -- | 21.3 | 24.3 | 0.9 |
| Fayette | 33.5 | -- | -- | -- | 2.1 | 5.4 | -- | -- | 1.6 | -- | 4.7 | -- | 9.3 | 9.7 | 0.7 |
| Franklin | 80.4 | -- | -- | 0.3 | 6.9 | 15.1 | -- | -- | 2.6 | -- | 9.9 | -- | 20.6 | 23.9 | 1.1 |
| Jefferson | 78.3 | 2.4 | -- | 0.1 | 9.4 | 16.7 | -- | -- | 1.1 | -- | 9.4 | -- | 20.0 | 18.4 | 0.8 |
| Jennings | 87.6 | -- | -- | 0.6 | 5.8 | 16.7 | -- | -- | 2.9 | -- | 15.6 | -- | 21.7 | 23.2 | 1.1 |
| Ohio | 27.9 | -- | -- | 0.2 | 2.1 | 5.6 | -- | -- | 0.7 | -- | 4.6 | -- | 6.7 | 7.7 | 0.3 |
| Ripley | 75.7 | 1.4 | -- | 0.1 | 7.8 | 16.3 | -- | -- | 1.1 | -- | 8.8 | -- | 20.0 | 19.2 | 1.0 |
| Switzerland | 75.2 | -- | -- | -- | 3.2 | 18.2 | -- | -- | 1.1 | -- | 13.7 | -- | 20.3 | 18.4 | 0.3 |
| Union | 21.4 | -- | -- | -- | 1.7 | 3.7 | -- | -- | 0.8 | -- | 3.5 | -- | 5.3 | 6.0 | 0.3 |
| Total | 571.1 | 3.8 | -- | 2.0 | 45.6 | 116.1 | -- | -- | 14.4 | -- | 86.7 | -- | 145.2 | 150.8 | 6.5 |

(Table 14 continued on next page)

(Table 14 continued on next page)

(Table 14 continued)

| Unit and County | All types | Forest type | | | | | | | | | | | | Cherry-ash-yellow-poplar | | Non-stocked |
|-----------------|-----------|---------------------|----------------|----------------------|----------|-------------|----------------------|---------------------|---------|-------------|--------------------|-------------|-------------|--------------------------|------|-------------|
| | | Jack-red-white pine | Shortleaf pine | Scotch-Virginia pine | Oak-pine | Oak-hickory | Chestnut-scarlet oak | Sassafras-persimmon | Oak-gum | Lowland oak | Elm-ash-soft maple | Cotton-wood | Maple-beech | | | |
| Northern Unit | | | | | | | | | | | | | | | | |
| Adams | 14.1 | 0.1 | -- | 0.1 | -- | 3.5 | 0.1 | -- | 0.1 | 0.3 | 3.8 | 0.1 | 3.5 | 2.2 | 0.3 | |
| Allen | 29.8 | 0.4 | -- | 0.1 | 0.2 | 5.7 | 0.2 | -- | -- | 0.4 | 8.7 | 0.3 | 6.7 | 6.6 | 0.5 | |
| Bartholomew | 44.8 | 0.3 | -- | 0.1 | 0.1 | 11.0 | 0.3 | -- | 0.2 | 1.0 | 11.8 | 0.3 | 11.9 | 6.9 | 0.9 | |
| Benton | 1.5 | -- | -- | -- | -- | 0.4 | -- | -- | -- | -- | 0.4 | -- | 0.4 | 0.3 | -- | |
| Blackford | 9.4 | -- | -- | -- | -- | 2.5 | -- | -- | -- | 0.3 | 2.2 | 0.1 | 2.7 | 1.4 | 0.2 | |
| Boone | 15.2 | -- | -- | -- | -- | 3.6 | 0.1 | -- | 0.1 | 0.4 | 3.7 | 0.1 | 4.2 | 2.5 | 0.5 | |
| Carroll | 18.4 | 0.1 | -- | 0.1 | -- | 4.6 | 0.1 | -- | 0.1 | 0.5 | 4.6 | 0.1 | 4.8 | 3.0 | 0.4 | |
| Cass | 24.2 | 0.4 | -- | 0.2 | -- | 5.9 | 0.2 | -- | -- | 0.3 | 7.4 | 0.1 | 5.5 | 3.8 | 0.4 | |
| Clinton | 9.2 | -- | -- | -- | -- | 2.3 | 0.1 | -- | -- | 0.2 | 2.1 | 0.1 | 2.7 | 1.5 | 0.2 | |
| Decatur | 24.1 | 0.1 | -- | -- | -- | 6.2 | 0.1 | -- | 0.1 | 0.7 | 5.7 | 0.2 | 6.8 | 3.7 | 0.5 | |
| De Kalb | 27.3 | 0.4 | -- | 0.2 | -- | 6.7 | 0.1 | -- | -- | 0.3 | 8.8 | 0.2 | 6.1 | 4.0 | 0.5 | |
| Delaware | 15.8 | 0.2 | -- | 0.1 | 0.1 | 3.4 | 0.1 | -- | -- | 0.2 | 4.6 | 0.1 | 3.9 | 2.9 | 0.2 | |
| Elkhart | 29.1 | 0.3 | -- | 0.1 | -- | 6.9 | 0.3 | -- | 0.2 | 0.6 | 8.3 | 0.2 | 6.6 | 4.6 | 1.0 | |
| Fountain | 36.6 | 0.5 | -- | 0.3 | -- | 9.2 | 0.2 | -- | 0.1 | 0.6 | 11.0 | 0.2 | 8.4 | 5.5 | 0.6 | |
| Fulton | 20.4 | 0.3 | -- | 0.1 | -- | 4.9 | 0.1 | -- | -- | 0.3 | 6.3 | 0.1 | 4.7 | 3.3 | 0.3 | |
| Grant | 18.2 | 0.1 | -- | 0.1 | -- | 4.8 | 0.1 | -- | 0.1 | 0.4 | 4.4 | 0.1 | 4.9 | 2.8 | 0.4 | |
| Hamilton | 20.0 | 0.2 | -- | 0.1 | -- | 4.9 | 0.2 | -- | 0.1 | 0.4 | 5.7 | 0.1 | 4.8 | 3.0 | 0.5 | |
| Hancock | 11.8 | 0.2 | -- | 0.1 | -- | 3.0 | -- | -- | -- | 0.1 | 3.5 | 0.1 | 2.8 | 1.9 | 0.1 | |
| Hendricks | 17.7 | 0.2 | -- | 0.1 | -- | 4.1 | 0.1 | -- | 0.1 | 0.3 | 4.9 | 0.1 | 4.5 | 2.9 | 0.4 | |
| Henry | 20.6 | 0.2 | -- | 0.1 | -- | 5.0 | 0.1 | -- | 0.1 | 0.4 | 5.7 | 0.1 | 5.3 | 3.2 | 0.4 | |
| Howard | 8.6 | -- | -- | -- | 0.1 | 1.5 | -- | -- | -- | 0.1 | 2.3 | 0.1 | 2.2 | 2.1 | 0.2 | |
| Huntington | 22.9 | 0.3 | -- | 0.2 | 0.1 | 4.8 | 0.1 | -- | -- | 0.2 | 7.4 | 0.2 | 5.4 | 3.9 | 0.3 | |
| Jasper | 27.0 | 0.3 | -- | 0.1 | 0.1 | 6.2 | 0.3 | -- | 0.2 | 0.5 | 7.7 | 0.2 | 6.3 | 4.4 | 0.7 | |
| Jay | 24.0 | 0.1 | -- | -- | -- | 6.3 | 0.1 | -- | 0.1 | 0.7 | 5.8 | 0.1 | 6.8 | 3.5 | 0.5 | |
| Johnson | 20.1 | 0.1 | -- | -- | -- | 5.1 | 0.1 | -- | 0.1 | 0.6 | 4.8 | 0.1 | 5.7 | 3.1 | 0.4 | |
| Kosciusko | 33.0 | 0.2 | -- | 0.1 | 0.1 | 8.5 | 0.2 | -- | 0.1 | 0.9 | 8.0 | 0.2 | 9.1 | 5.0 | 0.6 | |
| La Grange | 35.9 | 0.4 | -- | 0.2 | -- | 8.1 | 0.2 | -- | 0.1 | 0.4 | 12.0 | 0.2 | 8.6 | 4.8 | 0.9 | |
| Lake | 17.8 | 0.2 | -- | 0.1 | 0.1 | 4.4 | 0.1 | -- | 0.1 | 0.3 | 5.0 | 0.1 | 4.5 | 2.6 | 0.3 | |
| La Porte | 41.4 | 0.4 | -- | 0.1 | -- | 9.8 | 0.4 | -- | 0.3 | 0.9 | 11.9 | 0.2 | 9.8 | 6.1 | 1.5 | |
| Madison | 13.0 | 0.1 | -- | -- | -- | 3.3 | 0.1 | -- | -- | 0.3 | 3.3 | 0.1 | 3.4 | 2.2 | 0.2 | |
| Marion | 0.9 | -- | -- | -- | -- | 0.3 | -- | -- | -- | -- | 0.1 | -- | 0.3 | 0.2 | -- | |
| Marshall | 31.0 | 0.5 | -- | 0.1 | -- | 7.3 | 0.2 | -- | 0.1 | 0.5 | 9.5 | 0.2 | 7.1 | 4.9 | 0.6 | |
| Miami | 25.4 | 0.1 | -- | 0.1 | -- | 6.6 | 0.1 | -- | 0.1 | 0.7 | 6.2 | 0.2 | 7.0 | 3.8 | 0.5 | |
| Montgomery | 24.0 | 0.3 | -- | 0.2 | 0.1 | 5.6 | 0.1 | -- | -- | 0.3 | 6.8 | 0.2 | 5.7 | 4.4 | 0.3 | |
| Newton | 17.9 | 0.1 | -- | 0.1 | -- | 4.7 | 0.1 | -- | 0.1 | 0.4 | 4.7 | 0.1 | 4.7 | 2.7 | 0.2 | |
| Noble | 32.3 | 0.4 | -- | 0.2 | 0.1 | 7.3 | 0.1 | -- | 0.1 | 0.4 | 9.8 | 0.3 | 7.5 | 5.6 | 0.5 | |
| Porter | 30.6 | 0.3 | -- | 0.2 | -- | 7.4 | 0.1 | -- | 0.1 | 0.5 | 9.2 | 0.2 | 7.6 | 4.3 | 0.7 | |
| Pulaski | 27.0 | 0.4 | -- | 0.2 | -- | 6.5 | 0.2 | -- | 0.1 | 0.5 | 7.8 | 0.2 | 6.2 | 4.4 | 0.5 | |
| Randolph | 19.7 | -- | -- | -- | -- | 5.2 | 0.1 | -- | 0.1 | 0.6 | 4.4 | 0.1 | 5.7 | 3.0 | 0.4 | |
| Rush | 12.4 | 0.2 | -- | 0.1 | 0.1 | 2.5 | -- | -- | -- | 0.1 | 3.4 | 0.1 | 3.0 | 2.8 | 0.1 | |
| St. Joseph | 22.5 | 0.3 | -- | 0.2 | 0.1 | 5.3 | 0.2 | -- | 0.1 | 0.4 | 6.7 | 0.1 | 5.0 | 3.4 | 0.7 | |
| Shelby | 12.5 | -- | -- | -- | -- | 3.3 | -- | -- | 0.1 | 0.3 | 3.0 | 0.1 | 3.6 | 1.9 | 0.2 | |
| Starke | 26.9 | 0.3 | -- | 0.1 | 0.1 | 6.7 | 0.2 | -- | 0.1 | 0.5 | 7.3 | 0.2 | 6.5 | 4.3 | 0.6 | |
| Steuben | 31.5 | 0.4 | -- | 0.2 | 0.1 | 7.1 | 0.1 | -- | 0.1 | 0.4 | 9.6 | 0.2 | 7.4 | 5.4 | 0.5 | |
| Tippecanoe | 22.6 | 0.3 | -- | 0.2 | 0.1 | 5.3 | 0.1 | -- | 0.1 | 0.2 | 6.7 | 0.2 | 5.2 | 4.1 | 0.2 | |
| Tipton | 4.7 | -- | -- | 0.1 | 0.1 | 1.0 | -- | -- | -- | 0.1 | 1.2 | -- | 1.2 | 1.0 | -- | |
| Wabash | 24.0 | 0.2 | -- | 0.3 | 0.1 | 5.7 | 0.1 | -- | -- | 0.3 | 7.2 | 0.1 | 6.0 | 3.6 | 0.4 | |
| Warren | 23.8 | 0.2 | -- | 0.1 | 0.1 | 5.8 | 0.1 | -- | 0.1 | 0.5 | 6.2 | 0.2 | 6.1 | 4.0 | 0.4 | |
| Wayne | 31.9 | 0.4 | -- | 0.2 | -- | 7.7 | 0.2 | -- | 0.1 | 0.5 | 9.8 | 0.1 | 7.5 | 4.8 | 0.6 | |
| Wells | 16.2 | 0.2 | -- | 0.1 | 0.1 | 3.8 | 0.1 | -- | -- | 0.2 | 4.7 | 0.1 | 4.0 | 2.7 | 0.2 | |
| White | 13.0 | 0.2 | -- | 0.1 | -- | 2.8 | 0.1 | -- | -- | 0.1 | 4.2 | 0.1 | 3.0 | 2.1 | 0.3 | |
| Whitley | 20.5 | 0.3 | -- | 0.1 | -- | 4.9 | 0.1 | -- | -- | 0.4 | 6.5 | 0.1 | 4.6 | 3.1 | 0.4 | |
| Total | 1,123.2 | 11.2 | -- | 5.6 | 2.1 | 269.4 | 6.4 | -- | 3.6 | 20.5 | 316.8 | 7.3 | 277.9 | 180.2 | 22.2 | |
| All counties | 4,295.8 | 54.7 | 23.9 | 70.6 | 104.2 | 1,370.8 | 46.1 | 19.8 | 51.7 | 30.9 | 830.5 | 18.4 | 984.7 | 649.0 | 40.5 | |

Table 15.--Area of timberland by county and stand-size class, Indiana, 1986

(In thousand acres)

| Unit and county | All stands | Stand-size class | | | |
|-------------------|------------|------------------|------------|--------------------|------------|
| | | Sawtimber | Poletimber | Sapling & seedling | Nonstocked |
| Lower Wabash Unit | | | | | |
| Clay | 44.3 | 30.1 | 6.0 | 8.1 | 0.1 |
| Daviess | 41.6 | 27.2 | 5.8 | 8.4 | 0.2 |
| Gibson | 42.0 | 26.1 | 6.2 | 9.5 | 0.2 |
| Greene | 105.3 | 65.5 | 17.0 | 22.6 | 0.2 |
| Knox | 30.8 | 19.2 | 3.3 | 8.1 | 0.2 |
| Martin | 128.4 | 98.3 | 12.2 | 17.8 | 0.1 |
| Parke | 87.6 | 61.0 | 12.0 | 14.5 | 0.1 |
| Pike | 83.9 | 54.8 | 13.2 | 15.8 | 0.1 |
| Posey | 45.1 | 33.1 | 4.5 | 7.3 | 0.2 |
| Putnam | 76.5 | 56.6 | 6.2 | 13.5 | 0.2 |
| Sullivan | 64.7 | 42.0 | 9.2 | 13.3 | 0.2 |
| Vanderburgh | 24.7 | 16.2 | 3.0 | 5.4 | 0.1 |
| Vermillion | 34.7 | 21.7 | 4.6 | 8.3 | 0.1 |
| Vigo | 50.8 | 30.7 | 8.8 | 11.2 | 0.1 |
| Total | 860.4 | 582.5 | 112.0 | 163.8 | 2.1 |
| Knobs Unit | | | | | |
| Brown | 131.6 | 93.6 | 18.6 | 19.0 | 0.4 |
| Clark | 84.9 | 56.3 | 11.9 | 16.3 | 0.4 |
| Crawford | 119.3 | 76.2 | 17.6 | 24.9 | 0.6 |
| Dubois | 93.0 | 61.6 | 11.8 | 19.1 | 0.5 |
| Floyd | 34.5 | 24.7 | 3.8 | 5.9 | 0.1 |
| Harrison | 132.1 | 84.7 | 22.3 | 24.4 | 0.7 |
| Jackson | 120.6 | 75.3 | 21.4 | 23.2 | 0.7 |
| Lawrence | 125.3 | 89.4 | 15.7 | 19.7 | 0.5 |
| Monroe | 117.5 | 79.6 | 18.4 | 19.2 | 0.3 |
| Morgan | 86.7 | 54.4 | 12.3 | 19.3 | 0.7 |
| Orange | 129.1 | 86.3 | 19.2 | 22.0 | 1.6 |
| Owen | 107.5 | 71.9 | 13.4 | 21.8 | 0.4 |
| Perry | 152.5 | 101.7 | 22.9 | 27.0 | 0.9 |
| Scott | 43.0 | 27.2 | 6.4 | 9.1 | 0.3 |
| Spencer | 62.5 | 38.5 | 8.9 | 14.6 | 0.5 |
| Warrick | 81.4 | 44.9 | 14.5 | 21.3 | 0.7 |
| Washington | 119.6 | 82.4 | 14.9 | 21.9 | 0.4 |
| Total | 1,741.1 | 1,148.7 | 254.0 | 328.7 | 9.7 |
| Upland Flats Unit | | | | | |
| Dearborn | 91.1 | 43.9 | 20.7 | 25.6 | 0.9 |
| Fayette | 33.5 | 12.8 | 8.2 | 11.9 | 0.6 |
| Franklin | 80.4 | 31.7 | 18.6 | 29.0 | 1.1 |
| Jefferson | 78.3 | 45.9 | 12.9 | 18.7 | 0.8 |
| Jennings | 87.6 | 42.2 | 20.0 | 24.3 | 1.1 |
| Ohio | 27.9 | 12.8 | 6.2 | 8.6 | 0.3 |
| Ripley | 75.7 | 41.0 | 11.9 | 21.8 | 1.0 |
| Switzerland | 75.2 | 47.2 | 10.4 | 17.3 | 0.3 |
| Union | 21.4 | 7.9 | 5.0 | 8.1 | 0.4 |
| Total | 571.1 | 285.4 | 113.9 | 165.3 | 6.5 |

(Table 15 continued on next page)

(Table 15 continued)

| Unit and county | All stands | Stand-size class | | | |
|-----------------|------------|------------------|------------|--------------------|------------|
| | | Sawtimber | Poletimber | Sapling & seedling | Nonstocked |
| Northern Unit | | | | | |
| Adams | 14.1 | 9.8 | 2.3 | 1.6 | 0.4 |
| Allen | 29.8 | 17.6 | 6.0 | 5.7 | 0.5 |
| Bartholomew | 44.8 | 32.3 | 6.5 | 5.1 | 0.9 |
| Benton | 1.5 | 1.1 | 0.3 | 0.1 | -- |
| Blackford | 9.4 | 7.2 | 1.2 | 0.8 | 0.2 |
| Boone | 15.2 | 10.6 | 2.1 | 2.1 | 0.4 |
| Carroll | 18.4 | 12.7 | 3.0 | 2.3 | 0.4 |
| Cass | 24.2 | 15.8 | 4.8 | 3.2 | 0.4 |
| Clinton | 9.2 | 6.8 | 1.2 | 1.0 | 0.2 |
| Decatur | 24.1 | 18.3 | 3.0 | 2.3 | 0.5 |
| De Kalb | 27.3 | 17.6 | 5.3 | 3.9 | 0.5 |
| Delaware | 15.8 | 10.3 | 2.9 | 2.4 | 0.2 |
| Elkhart | 29.1 | 18.1 | 5.4 | 4.6 | 1.0 |
| Fountain | 36.6 | 24.9 | 6.8 | 4.3 | 0.6 |
| Fulton | 20.4 | 13.7 | 3.7 | 2.7 | 0.3 |
| Grant | 18.2 | 13.6 | 2.7 | 1.6 | 0.3 |
| Hamilton | 20.0 | 12.9 | 3.7 | 2.9 | 0.5 |
| Hancock | 11.8 | 7.8 | 2.3 | 1.5 | 0.2 |
| Hendricks | 17.7 | 11.7 | 2.9 | 2.7 | 0.4 |
| Henry | 20.6 | 13.6 | 3.6 | 3.0 | 0.4 |
| Howard | 8.6 | 5.3 | 1.5 | 1.7 | 0.1 |
| Huntington | 22.9 | 14.3 | 4.3 | 4.0 | 0.3 |
| Jasper | 27.0 | 17.3 | 4.9 | 4.1 | 0.7 |
| Jay | 24.0 | 18.4 | 3.0 | 2.1 | 0.5 |
| Johnson | 20.1 | 14.8 | 2.7 | 2.2 | 0.4 |
| Kosciusko | 33.0 | 25.1 | 4.3 | 2.9 | 0.7 |
| La Grange | 35.9 | 21.5 | 6.2 | 7.3 | 0.9 |
| Lake | 17.8 | 12.2 | 3.1 | 2.2 | 0.3 |
| La Porte | 41.4 | 26.4 | 7.1 | 6.5 | 1.4 |
| Madison | 13.0 | 9.5 | 2.0 | 1.3 | 0.2 |
| Marion | 0.9 | 0.3 | 0.3 | 0.3 | -- |
| Marshall | 31.0 | 20.3 | 5.6 | 4.5 | 0.6 |
| Miami | 25.4 | 19.4 | 3.4 | 2.1 | 0.5 |
| Montgomery | 24.0 | 15.9 | 4.7 | 3.2 | 0.2 |
| Newton | 17.9 | 13.4 | 2.9 | 1.4 | 0.2 |
| Noble | 32.3 | 20.7 | 6.1 | 5.0 | 0.5 |
| Porter | 30.6 | 19.1 | 5.7 | 5.1 | 0.7 |
| Pulaski | 27.0 | 17.9 | 5.0 | 3.6 | 0.5 |
| Randolph | 19.7 | 15.0 | 2.5 | 1.8 | 0.4 |
| Rush | 12.4 | 7.4 | 2.5 | 2.3 | 0.2 |
| St. Joseph | 22.5 | 13.8 | 4.3 | 3.7 | 0.7 |
| Shelby | 12.5 | 9.5 | 1.7 | 1.0 | 0.3 |
| Starke | 26.9 | 18.2 | 4.7 | 3.4 | 0.6 |
| Steuben | 31.5 | 20.1 | 5.8 | 5.1 | 0.5 |
| Tippecanoe | 22.6 | 14.6 | 4.6 | 3.2 | 0.2 |
| Tipton | 4.7 | 2.8 | 1.0 | 0.9 | -- |
| Wabash | 24.0 | 15.0 | 4.6 | 4.0 | 0.4 |
| Warren | 23.8 | 16.6 | 3.9 | 2.9 | 0.4 |
| Wayne | 31.9 | 20.6 | 5.9 | 4.8 | 0.6 |
| Wells | 16.2 | 10.9 | 3.0 | 2.1 | 0.2 |
| White | 13.0 | 7.7 | 2.6 | 2.4 | 0.3 |
| Whitley | 20.5 | 13.0 | 4.0 | 3.1 | 0.4 |
| Total | 1,123.2 | 753.4 | 193.6 | 154.0 | 22.2 |
| All counties | 4,295.8 | 2,770.0 | 673.5 | 811.8 | 40.5 |

Table 16.--Area of timberland by county and site class, Indiana, 1986

(In thousand acres)

| Unit and county | All classes | Site class (cubic feet of growth per acre per year) | | | | |
|-------------------|----------------|---|---------|--------|-------|-------|
| | | 165+ | 120-164 | 85-119 | 50-84 | 20-49 |
| Lower Wabash Unit | | | | | | |
| Clay | 44.3 | -- | 8.6 | 13.4 | 15.6 | 6.7 |
| Daviess | 41.6 | -- | 6.2 | 14.1 | 15.6 | 5.7 |
| Gibson | 42.0 | -- | 6.8 | 13.7 | 15.2 | 6.3 |
| Greene | 105.3 | -- | 18.1 | 36.2 | 36.1 | 14.9 |
| Knox | 30.8 | -- | 5.1 | 8.7 | 11.9 | 5.1 |
| Martin | 128.4 | -- | 17.0 | 44.8 | 53.0 | 13.6 |
| Parke | 87.6 | -- | 15.7 | 29.7 | 31.2 | 11.0 |
| Pike | 83.9 | -- | 13.6 | 30.2 | 29.6 | 10.5 |
| Posey | 45.1 | -- | 7.2 | 14.7 | 17.4 | 5.8 |
| Putnam | 76.5 | -- | 14.1 | 22.3 | 29.4 | 10.7 |
| Sullivan | 64.7 | -- | 10.0 | 23.0 | 23.1 | 8.6 |
| Vanderburgh | 24.7 | -- | 4.8 | 7.3 | 9.0 | 3.6 |
| Vermillion | 34.7 | -- | 5.4 | 11.8 | 12.7 | 4.8 |
| Vigo | 50.8 | -- | 8.4 | 17.3 | 17.8 | 7.3 |
| Total | 860.4 | -- | 141.0 | 287.2 | 317.6 | 114.6 |
| Knobs Unit | | | | | | |
| Brown | 131.6 | -- | 21.7 | 43.3 | 46.2 | 20.4 |
| Clark | 84.9 | -- | 15.4 | 26.7 | 29.4 | 13.4 |
| Crawford | 119.3 | -- | 20.7 | 36.7 | 39.4 | 22.5 |
| Dubois | 93.0 | -- | 16.2 | 32.3 | 31.1 | 13.4 |
| Floyd | 34.5 | -- | 6.4 | 14.0 | 10.5 | 3.6 |
| Harrison | 132.1 | -- | 21.3 | 41.8 | 45.7 | 23.3 |
| Jackson | 120.6 | -- | 17.2 | 36.2 | 44.5 | 22.7 |
| Lawrence | 125.3 | -- | 20.6 | 41.7 | 43.1 | 19.9 |
| Monroe | 117.5 | -- | 18.8 | 40.1 | 39.7 | 18.9 |
| Morgan | 86.7 | -- | 13.5 | 26.2 | 30.9 | 16.1 |
| Orange | 129.1 | -- | 20.2 | 39.8 | 44.8 | 24.3 |
| Owen | 107.5 | -- | 18.2 | 40.8 | 35.9 | 12.6 |
| Perry | 152.5 | -- | 24.0 | 47.5 | 52.4 | 28.6 |
| Scott | 43.0 | -- | 7.2 | 13.3 | 15.0 | 7.5 |
| Spencer | 62.5 | -- | 9.8 | 18.5 | 23.3 | 10.9 |
| Warrick | 81.4 | -- | 13.1 | 24.8 | 28.8 | 14.7 |
| Washington | 119.6 | -- | 22.3 | 48.2 | 37.1 | 12.0 |
| Total | 1,741.1 | -- | 286.6 | 571.9 | 597.8 | 284.8 |
| Upland Flats Unit | | | | | | |
| Dearborn | 91.1 | -- | 15.0 | 31.1 | 23.6 | 21.4 |
| Fayette | 33.5 | -- | 5.6 | 11.9 | 8.3 | 7.7 |
| Franklin | 80.4 | -- | 12.0 | 28.8 | 21.0 | 18.6 |
| Jefferson | 78.3 | -- | 18.2 | 29.6 | 18.7 | 11.8 |
| Jennings | 87.6 | -- | 15.1 | 31.0 | 21.3 | 20.2 |
| Ohio | 27.9 | -- | 4.5 | 9.6 | 7.3 | 6.5 |
| Ripley | 75.7 | -- | 16.5 | 27.8 | 19.6 | 11.8 |
| Switzerland | 75.2 | -- | 16.4 | 27.3 | 18.5 | 13.0 |
| Union | 21.4 | -- | 3.2 | 7.0 | 5.9 | 5.3 |
| Total | 571.1 | -- | 106.5 | 204.1 | 144.2 | 116.3 |

(Table 16: continued on next page)

(Table 16 continued)

| Unit and county | All classes | Site class (cubic feet of growth per acre per year) | | | | |
|-----------------|----------------|---|---------|---------|---------|-------|
| | | 165+ | 120-164 | 85-119 | 50-84 | 20-49 |
| Northern Unit | | | | | | |
| Adams | 14.1 | -- | 2.1 | 5.4 | 4.3 | 2.3 |
| Allen | 29.8 | -- | 3.9 | 12.5 | 8.2 | 5.2 |
| Bartholomew | 44.8 | -- | 6.6 | 17.2 | 13.9 | 7.1 |
| Benton | 1.5 | -- | 0.3 | 0.5 | 0.5 | 0.2 |
| Blackford | 9.4 | -- | 1.5 | 3.4 | 3.1 | 1.4 |
| Boone | 15.2 | -- | 2.3 | 5.6 | 4.8 | 2.5 |
| Carroll | 18.4 | -- | 2.8 | 6.9 | 5.7 | 3.0 |
| Cass | 24.2 | -- | 3.3 | 9.9 | 7.0 | 4.0 |
| Clinton | 9.2 | -- | 1.4 | 3.4 | 3.0 | 1.4 |
| Decatur | 24.1 | -- | 3.9 | 8.9 | 7.6 | 3.7 |
| De Kalb | 27.3 | -- | 3.8 | 10.6 | 8.1 | 4.8 |
| Delaware | 15.8 | -- | 2.3 | 6.2 | 4.6 | 2.7 |
| Elkhart | 29.1 | -- | 3.8 | 11.3 | 8.7 | 5.3 |
| Fountain | 36.6 | -- | 5.3 | 14.5 | 10.8 | 6.0 |
| Fulton | 20.4 | -- | 2.9 | 8.1 | 6.0 | 3.4 |
| Grant | 18.2 | -- | 3.1 | 6.8 | 5.6 | 2.7 |
| Hamilton | 20.0 | -- | 2.9 | 7.6 | 6.0 | 3.5 |
| Hancock | 11.8 | -- | 1.8 | 4.6 | 3.5 | 1.9 |
| Hendricks | 17.7 | -- | 2.4 | 6.9 | 5.4 | 3.0 |
| Henry | 20.6 | -- | 2.9 | 7.8 | 6.5 | 3.4 |
| Howard | 8.6 | -- | 1.3 | 3.4 | 2.4 | 1.5 |
| Huntington | 22.9 | -- | 3.1 | 9.3 | 6.7 | 3.8 |
| Jasper | 27.0 | -- | 3.6 | 10.7 | 8.0 | 4.7 |
| Jay | 24.0 | -- | 3.7 | 8.9 | 7.7 | 3.7 |
| Johnson | 20.1 | -- | 3.0 | 7.5 | 6.5 | 3.1 |
| Kosciusko | 33.0 | -- | 5.2 | 12.4 | 10.4 | 5.0 |
| La Grange | 35.9 | -- | 4.2 | 12.9 | 11.8 | 7.0 |
| Lake | 17.8 | -- | 2.7 | 6.8 | 5.4 | 2.9 |
| La Porte | 41.4 | -- | 5.5 | 15.6 | 12.8 | 7.5 |
| Madison | 13.0 | -- | 2.0 | 5.1 | 3.9 | 2.0 |
| Marion | 0.9 | -- | 0.1 | 0.3 | 0.4 | 0.1 |
| Marshall | 31.0 | -- | 4.0 | 12.4 | 9.3 | 5.3 |
| Miami | 25.4 | -- | 4.2 | 9.5 | 7.9 | 3.8 |
| Montgomery | 24.0 | -- | 3.8 | 9.5 | 6.8 | 3.9 |
| Newton | 17.9 | -- | 3.1 | 6.8 | 5.3 | 2.7 |
| Noble | 32.3 | -- | 4.5 | 12.8 | 9.4 | 5.6 |
| Porter | 30.6 | -- | 4.2 | 11.4 | 9.7 | 5.3 |
| Pulaski | 27.0 | -- | 3.9 | 10.7 | 7.8 | 4.6 |
| Randolph | 19.7 | -- | 3.1 | 7.2 | 6.4 | 3.0 |
| Rush | 12.4 | -- | 1.7 | 5.1 | 3.5 | 2.1 |
| St. Joseph | 22.5 | -- | 3.0 | 8.7 | 6.7 | 4.1 |
| Shelby | 12.5 | -- | 2.1 | 4.6 | 3.9 | 1.9 |
| Starke | 26.9 | -- | 3.9 | 10.5 | 8.1 | 4.4 |
| Steuben | 31.5 | -- | 4.4 | 12.1 | 9.4 | 5.6 |
| Tippecanoe | 22.6 | -- | 3.4 | 9.1 | 6.4 | 3.7 |
| Tipton | 4.7 | -- | 0.7 | 1.8 | 1.4 | 0.8 |
| Wabash | 24.0 | -- | 3.3 | 9.0 | 7.6 | 4.1 |
| Warren | 23.8 | -- | 3.6 | 9.1 | 7.2 | 3.9 |
| Wayne | 31.9 | -- | 4.1 | 12.6 | 9.8 | 5.4 |
| Wells | 16.2 | -- | 2.6 | 6.3 | 4.6 | 2.7 |
| White | 13.0 | -- | 1.7 | 4.9 | 4.0 | 2.4 |
| Whitley | 20.5 | -- | 2.6 | 8.2 | 6.2 | 3.5 |
| Total | 1,123.2 | -- | 161.6 | 433.3 | 340.7 | 187.6 |
| All counties | 4,295.8 | -- | 695.7 | 1,496.5 | 1,400.3 | 703.3 |

Table 17.--Area of timberland by county and stocking class of growing-stock trees, Indiana, 1986

(In thousand acres)

| Unit and county | All classes | Stocking class of growing-stock trees (percent) | | | | |
|-------------------|----------------|---|---------------|---------------|-----------------|--------|
| | | Less than 16.7 | 16.7- 59.9 | 60.0- 99.9 | 100.0- 129.9 | 130.0+ |
| Lower Wabash Unit | | | | | | |
| Clay | 44.3 | 0.1 | 4.2 | 23.2 | 15.2 | 1.6 |
| Daviess | 41.6 | 0.2 | 3.3 | 20.3 | 15.3 | 2.5 |
| Gibson | 42.0 | 0.2 | 3.5 | 21.5 | 14.6 | 2.2 |
| Greene | 105.3 | 0.2 | 8.2 | 54.3 | 37.2 | 5.4 |
| Knox | 30.8 | 0.2 | 3.4 | 16.2 | 9.5 | 1.5 |
| Martin | 128.4 | 0.1 | 9.0 | 59.1 | 53.9 | 6.3 |
| Parke | 87.6 | 0.1 | 5.3 | 44.5 | 34.0 | 3.7 |
| Pike | 83.9 | 0.1 | 4.9 | 42.0 | 32.8 | 4.1 |
| Posey | 45.1 | 0.2 | 3.4 | 21.9 | 17.3 | 2.3 |
| Putnam | 76.5 | 0.2 | 7.1 | 39.8 | 27.4 | 2.0 |
| Sullivan | 64.7 | 0.2 | 4.1 | 32.3 | 24.6 | 3.5 |
| Vanderburgh | 24.7 | 0.1 | 2.0 | 13.6 | 8.0 | 1.0 |
| Vermillion | 34.7 | 0.1 | 2.6 | 17.9 | 12.1 | 2.0 |
| Vigo | 50.8 | 0.1 | 3.8 | 26.3 | 18.0 | 2.6 |
| Total | 860.4 | 2.1 | 64.8 | 432.9 | 319.9 | 40.7 |
| Knobs Unit | | | | | | |
| Brown | 131.6 | 0.3 | 6.1 | 53.4 | 61.4 | 10.4 |
| Clark | 84.9 | 0.4 | 5.7 | 33.7 | 37.7 | 7.4 |
| Crawford | 119.3 | 0.6 | 6.0 | 50.2 | 52.9 | 9.6 |
| Dubois | 93.0 | 0.5 | 6.2 | 37.9 | 41.5 | 6.9 |
| Floyd | 34.5 | 0.2 | 2.9 | 13.0 | 16.0 | 2.4 |
| Harrison | 132.1 | 0.6 | 8.4 | 54.6 | 60.1 | 8.4 |
| Jackson | 120.6 | 0.7 | 7.6 | 50.5 | 54.6 | 7.2 |
| Lawrence | 125.3 | 0.5 | 5.7 | 52.6 | 57.2 | 9.3 |
| Monroe | 117.5 | 0.4 | 6.5 | 49.8 | 53.2 | 7.6 |
| Morgan | 86.7 | 0.8 | 6.3 | 36.2 | 38.1 | 5.3 |
| Orange | 129.1 | 1.6 | 6.5 | 52.8 | 59.2 | 9.0 |
| Owen | 107.5 | 0.3 | 9.4 | 40.6 | 50.1 | 7.1 |
| Perry | 152.5 | 0.9 | 6.0 | 58.3 | 72.4 | 14.9 |
| Scott | 43.0 | 0.3 | 2.9 | 17.8 | 19.0 | 3.0 |
| Spencer | 62.5 | 0.5 | 4.6 | 25.7 | 27.7 | 4.0 |
| Warrick | 81.4 | 0.7 | 7.1 | 33.4 | 35.0 | 5.2 |
| Washington | 119.6 | 0.4 | 10.8 | 43.5 | 55.5 | 9.4 |
| Total | 1,741.1 | 9.7 | 108.7 | 704.0 | 791.6 | 127.1 |
| Upland Flats Unit | | | | | | |
| Dearborn | 91.1 | 0.9 | 19.6 | 42.3 | 23.4 | 4.9 |
| Fayette | 33.5 | 0.6 | 8.7 | 14.3 | 8.0 | 1.9 |
| Franklin | 80.4 | 1.2 | 19.5 | 36.4 | 18.8 | 4.5 |
| Jefferson | 78.3 | 0.8 | 13.7 | 36.9 | 23.6 | 3.3 |
| Jennings | 87.6 | 1.1 | 19.3 | 38.9 | 23.3 | 5.0 |
| Ohio | 27.9 | 0.3 | 6.2 | 12.8 | 7.0 | 1.6 |
| Ripley | 75.7 | 0.9 | 14.0 | 36.7 | 21.0 | 3.1 |
| Switzerland | 75.2 | 0.3 | 11.3 | 36.1 | 23.2 | 4.3 |
| Union | 21.4 | 0.4 | 5.3 | 9.7 | 4.9 | 1.1 |
| Total | 571.1 | 6.5 | 117.6 | 264.1 | 153.2 | 29.7 |

(Table 17 continued on next page)

(Table 17 continued)

| Unit and county | All classes | Stocking percent of growing-stock trees | | | | |
|-----------------|-------------|---|-----------|-----------|-------------|--------|
| | | Less than 16.7 | 16.7-59.9 | 60.0-99.9 | 100.0-129.9 | 130.0+ |
| Northern Unit | | | | | | |
| Adams | 14.1 | 0.3 | 2.8 | 7.0 | 3.5 | 0.5 |
| Allen | 29.8 | 0.5 | 8.3 | 14.4 | 5.7 | 0.9 |
| Bartholomew | 44.8 | 0.9 | 8.9 | 21.7 | 11.8 | 1.5 |
| Benton | 1.5 | -- | 0.3 | 0.7 | 0.4 | 0.1 |
| Blackford | 9.4 | 0.2 | 1.7 | 4.5 | 2.7 | 0.3 |
| Boone | 15.2 | 0.4 | 3.2 | 7.2 | 4.0 | 0.4 |
| Carroll | 18.4 | 0.4 | 3.8 | 8.9 | 4.7 | 0.6 |
| Cass | 24.2 | 0.4 | 5.1 | 12.3 | 5.4 | 1.0 |
| Clinton | 9.2 | 0.2 | 1.8 | 4.3 | 2.6 | 0.3 |
| Decatur | 24.1 | 0.5 | 4.3 | 11.7 | 6.8 | 0.8 |
| De Kalb | 27.3 | 0.5 | 5.5 | 14.3 | 6.0 | 1.0 |
| Delaware | 15.8 | 0.2 | 3.5 | 8.1 | 3.5 | 0.5 |
| Elkhart | 29.1 | 1.0 | 6.4 | 14.3 | 6.4 | 1.0 |
| Fountain | 36.6 | 0.6 | 7.1 | 19.0 | 8.5 | 1.4 |
| Fulton | 20.4 | 0.4 | 4.3 | 10.3 | 4.6 | 0.8 |
| Grant | 18.2 | 0.3 | 3.2 | 9.2 | 4.9 | 0.6 |
| Hamilton | 20.0 | 0.5 | 4.0 | 10.2 | 4.6 | 0.7 |
| Hancock | 11.8 | 0.1 | 2.4 | 6.1 | 2.7 | 0.5 |
| Hendricks | 17.7 | 0.4 | 4.1 | 8.3 | 4.3 | 0.6 |
| Henry | 20.6 | 0.4 | 4.4 | 10.0 | 5.1 | 0.7 |
| Howard | 8.6 | 0.1 | 2.4 | 4.2 | 1.7 | 0.2 |
| Huntington | 22.9 | 0.3 | 4.9 | 11.8 | 5.1 | 0.8 |
| Jasper | 27.0 | 0.7 | 6.1 | 13.2 | 6.1 | 0.9 |
| Jay | 24.0 | 0.5 | 4.4 | 11.5 | 6.8 | 0.8 |
| Johnson | 20.1 | 0.5 | 4.0 | 9.4 | 5.6 | 0.6 |
| Kosciusko | 33.0 | 0.6 | 6.1 | 15.9 | 9.3 | 1.1 |
| La Grange | 35.9 | 0.9 | 8.1 | 17.8 | 8.0 | 1.1 |
| Lake | 17.8 | 0.4 | 3.4 | 9.0 | 4.4 | 0.6 |
| La Porte | 41.4 | 1.4 | 8.9 | 20.1 | 9.7 | 1.3 |
| Madison | 13.0 | 0.2 | 2.5 | 6.4 | 3.4 | 0.5 |
| Marion | 0.9 | -- | 0.4 | 0.3 | 0.2 | -- |
| Marshall | 31.0 | 0.6 | 7.0 | 15.2 | 7.0 | 1.2 |
| Miami | 25.4 | 0.5 | 4.4 | 12.5 | 7.1 | 0.9 |
| Montgomery | 24.0 | 0.2 | 4.9 | 12.8 | 5.2 | 0.9 |
| Newton | 17.9 | 0.3 | 2.8 | 9.4 | 4.7 | 0.7 |
| Noble | 32.3 | 0.5 | 7.1 | 16.5 | 7.0 | 1.2 |
| Porter | 30.6 | 0.7 | 6.3 | 15.4 | 7.2 | 1.0 |
| Pulaski | 27.0 | 0.6 | 5.6 | 13.7 | 6.1 | 1.0 |
| Randolph | 19.7 | 0.4 | 3.6 | 9.4 | 5.7 | 0.6 |
| Rush | 12.4 | 0.1 | 3.5 | 5.9 | 2.5 | 0.4 |
| St. Joseph | 22.5 | 0.7 | 4.9 | 11.2 | 4.9 | 0.8 |
| Shelby | 12.5 | 0.2 | 2.2 | 6.1 | 3.6 | 0.4 |
| Starke | 26.9 | 0.6 | 5.5 | 13.3 | 6.5 | 1.0 |
| Steuben | 31.5 | 0.5 | 6.9 | 16.2 | 6.8 | 1.1 |
| Tippecanoe | 22.6 | 0.2 | 4.9 | 11.8 | 4.8 | 0.9 |
| Tipton | 4.7 | -- | 1.4 | 2.2 | 1.0 | 0.1 |
| Wabash | 24.0 | 0.4 | 5.2 | 12.0 | 5.6 | 0.8 |
| Warren | 23.8 | 0.4 | 4.9 | 11.8 | 5.9 | 0.8 |
| Wayne | 31.9 | 0.6 | 6.9 | 15.9 | 7.3 | 1.2 |
| Wells | 16.2 | 0.2 | 3.2 | 8.5 | 3.7 | 0.6 |
| White | 13.0 | 0.3 | 3.0 | 6.6 | 2.7 | 0.4 |
| Whitley | 20.5 | 0.4 | 4.5 | 10.3 | 4.5 | 0.8 |
| Total | 1,123.2 | 22.2 | 235.0 | 558.8 | 268.3 | 38.9 |
| All counties | 4,295.8 | 40.5 | 526.1 | 1,959.8 | 1,533.0 | 236.4 |

Table 18.--Area of timberland by forest type, ownership class and Forest Survey Unit, Indiana, 1986

(In thousand acres)

| Unit and forest type | Ownership class | | | | | | | Misc. priv.- corp. | Misc. priv.- indiv. |
|--------------------------|-----------------|--------------------|------------------|-------|-----------------------|--------------------|---------|--------------------------|---------------------------|
| | All owners | National Forest | Misc. federal | State | County & municipal | Forest industry | Farmer | | |
| All Units | | | | | | | | | |
| Jack-red-white pine | 54.7 | 11.5 | -- | 4.5 | -- | -- | 6.4 | 14.0 | 18.3 |
| Shortleaf pine | 23.9 | 14.8 | -- | 3.5 | -- | -- | 1.9 | 1.6 | 2.1 |
| Scotch-Virginia pine | 70.6 | -- | -- | 4.0 | -- | -- | 37.0 | 9.4 | 20.2 |
| Oak-pine | 104.2 | 3.4 | 2.5 | 1.9 | -- | -- | 50.4 | 6.3 | 39.7 |
| Oak-hickory | 1,370.8 | 99.7 | 70.0 | 92.6 | 8.3 | 12.5 | 451.4 | 111.4 | 524.9 |
| Chestnut-scarlet oak | 46.1 | 6.2 | -- | 13.9 | -- | -- | 1.2 | -- | 24.8 |
| Sassafras-persimmon | 19.8 | -- | -- | -- | -- | -- | 6.7 | 2.1 | 11.0 |
| Oak-gum | 51.7 | -- | -- | 6.6 | -- | -- | 23.0 | 6.2 | 15.9 |
| Lowland oak | 30.9 | -- | -- | -- | -- | -- | 16.2 | 4.4 | 10.3 |
| Elm-ash-soft maple | 830.5 | 2.0 | 28.4 | 17.8 | 11.5 | -- | 374.7 | 103.1 | 293.0 |
| Cottonwood | 18.4 | -- | -- | 2.1 | 2.3 | -- | 2.8 | 8.8 | 2.4 |
| Maple-beech | 984.7 | 10.7 | 42.1 | 13.1 | 4.8 | 3.8 | 422.1 | 88.9 | 399.2 |
| Cherry-ash-yellow-poplar | 649.0 | 16.0 | 16.9 | 17.4 | 2.0 | -- | 295.2 | 48.5 | 253.0 |
| Nonstocked | 40.5 | 1.7 | 2.7 | -- | -- | 2.1 | 14.9 | 2.4 | 16.7 |
| All types | 4,295.8 | 166.0 | 162.6 | 177.4 | 28.9 | 18.4 | 1,703.9 | 407.1 | 1,631.5 |
| Lower Wabash Unit | | | | | | | | | |
| Jack-red-white pine | 9.9 | -- | -- | -- | -- | -- | -- | 9.9 | -- |
| Shortleaf pine | 3.7 | 0.5 | -- | 1.6 | -- | -- | -- | 1.6 | -- |
| Scotch-Virginia pine | 17.3 | -- | -- | -- | -- | -- | 8.6 | 5.4 | 3.3 |
| Oak-pine | 2.3 | -- | -- | -- | -- | -- | -- | 2.3 | -- |
| Oak-hickory | 296.1 | 4.5 | 40.4 | 2.0 | -- | -- | 101.7 | 25.5 | 122.0 |
| Chestnut-scarlet oak | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sassafras-persimmon | 7.4 | -- | -- | -- | -- | -- | 4.8 | -- | 2.6 |
| Oak-gum | 8.1 | -- | -- | 4.3 | -- | -- | -- | 1.5 | 2.3 |
| Lowland oak | 8.3 | -- | -- | -- | -- | -- | 2.0 | 2.0 | 4.3 |
| Elm-ash-soft maple | 224.4 | 0.8 | 4.6 | 11.2 | 4.0 | -- | 92.2 | 36.8 | 74.8 |
| Cottonwood | 6.7 | -- | -- | 2.1 | 2.3 | -- | -- | 2.3 | -- |
| Maple-beech | 159.4 | 2.2 | 8.6 | 2.0 | -- | -- | 52.8 | 24.3 | 69.5 |
| Cherry-ash-yellow-poplar | 114.7 | 1.0 | 5.6 | 6.3 | 2.0 | -- | 50.4 | 11.3 | 38.1 |
| Nonstocked | 2.1 | -- | -- | -- | -- | 2.1 | -- | -- | -- |
| All types | 860.4 | 9.0 | 59.2 | 29.5 | 8.3 | 2.1 | 312.5 | 122.9 | 316.9 |
| Knobs Unit | | | | | | | | | |
| Jack-red-white pine | 29.8 | 11.5 | -- | 4.5 | -- | -- | 3.6 | 4.1 | 6.1 |
| Shortleaf pine | 20.2 | 14.3 | -- | 1.9 | -- | -- | 1.9 | -- | 2.1 |
| Scotch-Virginia pine | 45.7 | -- | -- | 4.0 | -- | -- | 20.8 | 4.0 | 16.9 |
| Oak-pine | 54.2 | 3.4 | 2.5 | 1.9 | -- | -- | 25.7 | 1.9 | 18.8 |
| Oak-hickory | 689.2 | 95.2 | 20.1 | 80.6 | 3.8 | 9.7 | 177.9 | 50.9 | 251.0 |
| Chestnut-scarlet oak | 39.7 | 6.2 | -- | 13.9 | -- | -- | -- | -- | 19.6 |
| Sassafras-persimmon | 12.4 | -- | -- | -- | -- | -- | 1.9 | 2.1 | 8.4 |
| Oak-gum | 25.6 | -- | -- | 2.3 | -- | -- | 13.1 | 2.0 | 8.2 |
| Lowland oak | 2.1 | -- | -- | -- | -- | -- | 2.1 | -- | -- |
| Elm-ash-soft maple | 202.6 | 1.2 | 10.7 | 4.2 | -- | -- | 66.5 | 31.7 | 88.3 |
| Cottonwood | 4.4 | -- | -- | -- | -- | -- | -- | 4.4 | -- |
| Maple-beech | 402.2 | 8.5 | 22.6 | 10.1 | 2.1 | 3.8 | 127.7 | 38.7 | 188.7 |
| Cherry-ash-yellow-poplar | 203.3 | 15.0 | 6.1 | 5.9 | -- | -- | 73.3 | 14.8 | 88.2 |
| Nonstocked | 9.7 | 1.7 | -- | -- | -- | -- | -- | -- | 8.0 |
| All types | 1,741.1 | 157.0 | 62.0 | 129.3 | 5.9 | 13.5 | 514.5 | 154.6 | 704.3 |

(Table 18 continued on next page)

(Table 18 continued)

| Unit and forest type | Ownership class | | | | | | | | Misc. priv.- corp. | Misc. priv.- indiv. |
|--------------------------|-----------------|--------------------|------------------|-------|-----------------------|--------------------|--------|-------|--------------------------|---------------------------|
| | All owners | National Forest | Misc. federal | State | County & municipal | Forest industry | Farmer | | | |
| Upland Flats Unit | | | | | | | | | | |
| Jack-red-white pine | 3.8 | -- | -- | -- | -- | -- | -- | -- | 3.8 | |
| Shortleaf pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Scotch-Virginia pine | 2.0 | -- | -- | -- | -- | -- | 2.0 | -- | -- | |
| Oak-pine | 45.6 | -- | -- | -- | -- | -- | 22.6 | 2.1 | 20.9 | |
| Oak-hickory | 116.1 | -- | 4.7 | 4.8 | -- | -- | 47.7 | 8.9 | 50.0 | |
| Chestnut-scarlet oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Sassafras-persimmon | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Oak-gum | 14.4 | -- | -- | -- | -- | -- | 7.5 | 2.7 | 4.2 | |
| Lowland oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Elm-ash-soft maple | 86.7 | -- | 2.1 | -- | -- | -- | 45.8 | 2.1 | 36.7 | |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Maple-beech | 145.2 | -- | 4.0 | -- | 2.7 | -- | 67.3 | 4.1 | 67.1 | |
| Cherry-ash-yellow-poplar | 150.8 | -- | -- | 2.8 | -- | -- | 76.7 | 6.6 | 64.7 | |
| Nonstocked | 6.5 | -- | 2.7 | -- | -- | -- | 1.7 | -- | 2.1 | |
| All types | 571.1 | -- | 13.5 | 7.6 | 2.7 | -- | 271.3 | 26.5 | 249.5 | |
| Northern Unit | | | | | | | | | | |
| Jack-red-white pine | 11.2 | -- | -- | -- | -- | -- | 2.8 | -- | 8.4 | |
| Shortleaf pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Scotch-Virginia pine | 5.6 | -- | -- | -- | -- | -- | 5.6 | -- | -- | |
| Oak-pine | 2.1 | -- | -- | -- | -- | -- | 2.1 | -- | -- | |
| Oak-hickory | 269.4 | -- | 4.8 | 5.2 | 4.5 | 2.8 | 124.1 | 26.1 | 101.9 | |
| Chestnut-scarlet oak | 6.4 | -- | -- | -- | -- | -- | 1.2 | -- | 5.2 | |
| Sassafras-persimmon | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Oak-gum | 3.6 | -- | -- | -- | -- | -- | 2.4 | -- | 1.2 | |
| Lowland oak | 20.5 | -- | -- | -- | -- | -- | 12.1 | 2.4 | 6.0 | |
| Elm-ash-soft maple | 316.8 | -- | 11.0 | 2.4 | 7.5 | -- | 170.2 | 32.5 | 93.2 | |
| Cottonwood | 7.3 | -- | -- | -- | -- | -- | 2.8 | 2.1 | 2.4 | |
| Maple-beech | 277.9 | -- | 6.9 | 1.0 | -- | -- | 174.3 | 21.8 | 73.9 | |
| Cherry-ash-yellow-poplar | 180.2 | -- | 5.2 | 2.4 | -- | -- | 94.8 | 15.8 | 62.0 | |
| Nonstocked | 22.2 | -- | -- | -- | -- | -- | 13.2 | 2.4 | 6.6 | |
| All types | 1,123.2 | -- | 27.9 | 11.0 | 12.0 | 2.8 | 605.6 | 103.1 | 360.8 | |

Table 19.--Area of timberland by ownership class, stocking class of growing-stock trees, and Forest Survey Unit, Indiana, 1986

(In thousand acres)

| Unit and ownership class | All classes | Stocking class of growing stock trees (percent) | | | | |
|---------------------------|-------------|---|-----------|-----------|-------------|--------|
| | | Less than 16.7 | 16.7-59.9 | 60.0-99.9 | 100.0-129.9 | 130.0+ |
| All Units | | | | | | |
| National forest | 166.0 | 1.7 | 2.0 | 58.5 | 82.0 | 21.8 |
| Miscellaneous federal | 162.6 | 2.7 | 6.3 | 66.2 | 76.9 | 10.5 |
| State | 177.4 | -- | 6.6 | 60.3 | 94.6 | 15.9 |
| County and municipal | 28.9 | -- | 11.5 | 1.7 | 15.7 | -- |
| Forest industry | 18.4 | 2.1 | -- | 6.8 | 9.5 | -- |
| Farmer | 1,703.9 | 14.9 | 266.3 | 811.0 | 526.7 | 85.0 |
| Misc. private-corporation | 407.1 | 2.4 | 48.2 | 176.8 | 157.1 | 22.6 |
| Misc. private-individual | 1,631.5 | 16.7 | 185.2 | 778.5 | 570.5 | 80.6 |
| All owners | 4,295.8 | 40.5 | 526.1 | 1,959.8 | 1,533.0 | 236.4 |
| Lower Wabash Unit | | | | | | |
| National forest | 9.0 | -- | 1.0 | 3.0 | 5.0 | -- |
| Miscellaneous federal | 59.2 | -- | -- | 17.0 | 40.2 | 2.0 |
| State | 29.5 | -- | 4.2 | 15.0 | 10.3 | -- |
| County and municipal | 8.3 | -- | 2.0 | -- | 6.3 | -- |
| Forest industry | 2.1 | 2.1 | -- | -- | -- | -- |
| Farmer | 312.5 | -- | 36.7 | 169.8 | 88.5 | 17.5 |
| Misc. private-corporation | 122.9 | -- | 4.3 | 58.4 | 54.3 | 5.9 |
| Misc. private-individual | 316.9 | -- | 16.6 | 169.7 | 115.3 | 15.3 |
| All owners | 860.4 | 2.1 | 64.8 | 432.9 | 319.9 | 40.7 |
| Knobs Unit | | | | | | |
| National forest | 157.0 | 1.7 | 1.0 | 55.5 | 77.0 | 21.8 |
| Miscellaneous federal | 62.0 | -- | 2.5 | 33.7 | 20.1 | 5.7 |
| State | 129.3 | -- | -- | 38.4 | 80.5 | 10.4 |
| County and municipal | 5.9 | -- | 1.7 | -- | 4.2 | -- |
| Forest industry | 13.5 | -- | -- | 4.0 | 9.5 | -- |
| Farmer | 514.5 | -- | 48.8 | 213.0 | 221.3 | 31.4 |
| Misc. private-corporation | 154.6 | -- | 18.7 | 62.1 | 59.8 | 14.0 |
| Misc. private-individual | 704.3 | 8.0 | 36.0 | 297.3 | 319.2 | 43.8 |
| All owners | 1,741.1 | 9.7 | 108.7 | 704.0 | 791.6 | 127.1 |
| Upland Flats Unit | | | | | | |
| National forest | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 13.5 | 2.7 | 2.1 | 3.8 | 4.9 | -- |
| State | 7.6 | -- | -- | 2.1 | -- | 5.5 |
| County and municipal | 2.7 | -- | 2.7 | -- | -- | -- |
| Forest industry | -- | -- | -- | -- | -- | -- |
| Farmer | 271.3 | 1.7 | 56.3 | 110.9 | 91.6 | 10.8 |
| Misc. private-corporation | 26.5 | -- | 6.2 | 10.7 | 6.9 | 2.7 |
| Misc. private-individual | 249.5 | 2.1 | 50.3 | 136.6 | 49.8 | 10.7 |
| All owners | 571.1 | 6.5 | 117.6 | 264.1 | 153.2 | 29.7 |
| Northern Unit | | | | | | |
| National forest | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 27.9 | -- | 1.7 | 11.7 | 11.7 | 2.8 |
| State | 11.0 | -- | 2.4 | 4.8 | 3.8 | -- |
| County and municipal | 12.0 | -- | 5.1 | 1.7 | 5.2 | -- |
| Forest industry | 2.8 | -- | -- | 2.8 | -- | -- |
| Farmer | 605.6 | 13.2 | 124.5 | 317.3 | 125.3 | 25.3 |
| Misc. private-corporation | 103.1 | 2.4 | 19.0 | 45.6 | 36.1 | -- |
| Misc. private-individual | 360.8 | 6.6 | 82.3 | 174.9 | 86.2 | 10.8 |
| All owners | 1,123.2 | 22.2 | 235.0 | 558.8 | 268.3 | 38.9 |

Table 20.--Area of timberland by forest type, stand-size class,
and Forest Survey Unit, Indiana, 1986

(In thousand acres)

| Unit and forest type | All stands | Stand-size class | | | |
|--------------------------|----------------|------------------|--------------|-----------------------|-------------|
| | | Sawtimber | Poletimber | Sapling & seedling | Nonstocked |
| All Units | | | | | |
| Jack-red-white pine | 54.7 | 22.3 | 18.3 | 14.1 | -- |
| Shortleaf pine | 23.9 | 7.6 | 14.5 | 1.8 | -- |
| Scotch-Virginia pine | 70.6 | 24.4 | 14.1 | 32.1 | -- |
| Oak-pine | 104.2 | 44.6 | 25.8 | 33.8 | -- |
| Oak-hickory | 1,370.8 | 975.9 | 189.8 | 205.1 | -- |
| Chestnut-scarlet oak | 46.1 | 46.1 | -- | -- | -- |
| Sassafras-persimmon | 19.8 | -- | 4.2 | 15.6 | -- |
| Oak-gum | 51.7 | 29.7 | 4.6 | 17.4 | -- |
| Lowland oak | 30.9 | 25.3 | 3.6 | 2.0 | -- |
| Elm-ash-soft maple | 830.5 | 495.4 | 169.1 | 166.0 | -- |
| Cottonwood | 18.4 | 11.7 | 6.7 | -- | -- |
| Maple-beech | 984.7 | 692.3 | 110.5 | 181.9 | -- |
| Cherry-ash-yellow-poplar | 649.0 | 394.7 | 112.3 | 142.0 | -- |
| Nonstocked | 40.5 | -- | -- | -- | 40.5 |
| All types | 4,295.8 | 2,770.0 | 673.5 | 811.8 | 40.5 |
| Lower Wabash Unit | | | | | |
| Jack-red-white pine | 9.9 | 7.6 | 2.3 | -- | -- |
| Shortleaf pine | 3.7 | -- | 3.7 | -- | -- |
| Scotch-Virginia pine | 17.3 | 7.4 | 3.1 | 6.8 | -- |
| Oak-pine | 2.3 | 2.3 | -- | -- | -- |
| Oak-hickory | 296.1 | 218.6 | 27.4 | 50.1 | -- |
| Chestnut-scarlet oak | -- | -- | -- | -- | -- |
| Sassafras-persimmon | 7.4 | -- | -- | 7.4 | -- |
| Oak-gum | 8.1 | 5.8 | 2.3 | -- | -- |
| Lowland oak | 8.3 | 6.3 | -- | 2.0 | -- |
| Elm-ash-soft maple | 224.4 | 132.5 | 36.1 | 55.8 | -- |
| Cottonwood | 6.7 | 2.3 | 4.4 | -- | -- |
| Maple-beech | 159.4 | 113.1 | 20.5 | 25.8 | -- |
| Cherry-ash-yellow-poplar | 114.7 | 86.6 | 12.2 | 15.9 | -- |
| Nonstocked | 2.1 | -- | -- | -- | 2.1 |
| All types | 860.4 | 582.5 | 112.0 | 163.8 | 2.1 |
| Knobs Unit | | | | | |
| Jack-red-white pine | 29.8 | 8.1 | 7.6 | 14.1 | -- |
| Shortleaf pine | 20.2 | 7.6 | 10.8 | 1.8 | -- |
| Scotch-Virginia pine | 45.7 | 14.2 | 8.2 | 23.3 | -- |
| Oak-pine | 54.2 | 25.3 | 13.3 | 15.6 | -- |
| Oak-hickory | 689.2 | 502.5 | 86.8 | 99.9 | -- |
| Chestnut-scarlet oak | 39.7 | 39.7 | -- | -- | -- |
| Sassafras-persimmon | 12.4 | -- | 4.2 | 8.2 | -- |
| Oak-gum | 25.6 | 16.7 | 2.3 | 6.6 | -- |
| Lowland oak | 2.1 | 2.1 | -- | -- | -- |
| Elm-ash-soft maple | 202.6 | 105.1 | 48.3 | 49.2 | -- |
| Cottonwood | 4.4 | 2.1 | 2.3 | -- | -- |
| Maple-beech | 402.2 | 295.9 | 38.6 | 67.7 | -- |
| Cherry-ash-yellow-poplar | 203.3 | 129.4 | 31.6 | 42.3 | -- |
| Nonstocked | 9.7 | -- | -- | -- | 9.7 |
| All types | 1,741.1 | 1,148.7 | 254.0 | 328.7 | 9.7 |

(Table 20 continued on next page)

(Table 20 continued)

| Unit and forest type | All stands | Stand-size class | | | |
|--------------------------|---------------|------------------|------------|-----------------------|------------|
| | | Sawtimber | Poletimber | Sapling & seedling | Nonstocked |
| Upland Flats Unit | | | | | |
| Jack-red-white pine | 3.8 | 3.8 | -- | -- | -- |
| Shortleaf pine | -- | -- | -- | -- | -- |
| Scotch-Virginia pine | 2.0 | -- | -- | 2.0 | -- |
| Oak-pine | 45.6 | 17.0 | 12.5 | 16.1 | -- |
| Oak-hickory | 116.1 | 70.9 | 17.4 | 27.8 | -- |
| Chestnut-scarlet oak | -- | -- | -- | -- | -- |
| Sassafras-persimmon | -- | -- | -- | -- | -- |
| Oak-gum | 14.4 | 4.8 | -- | 9.6 | -- |
| Lowland oak | -- | -- | -- | -- | -- |
| Elm-ash-soft maple | 86.7 | 44.4 | 21.8 | 20.5 | -- |
| Cottonwood | -- | -- | -- | -- | -- |
| Maple-beech | 145.2 | 83.1 | 16.9 | 45.2 | -- |
| Cherry-ash-yellow-poplar | 150.8 | 61.4 | 45.3 | 44.1 | -- |
| Nonstocked | 6.5 | -- | -- | -- | 6.5 |
| All types | 571.1 | 285.4 | 113.9 | 165.3 | 6.5 |
| Northern Unit | | | | | |
| Jack-red-white pine | 11.2 | 2.8 | 8.4 | -- | -- |
| Shortleaf pine | -- | -- | -- | -- | -- |
| Scotch-Virginia pine | 5.6 | 2.8 | 2.8 | -- | -- |
| Oak-pine | 2.1 | -- | -- | 2.1 | -- |
| Oak-hickory | 269.4 | 183.9 | 58.2 | 27.3 | -- |
| Chestnut-scarlet oak | 6.4 | 6.4 | -- | -- | -- |
| Sassafras-persimmon | -- | -- | -- | -- | -- |
| Oak-gum | 3.6 | 2.4 | -- | 1.2 | -- |
| Lowland oak | 20.5 | 16.9 | 3.6 | -- | -- |
| Elm-ash-soft maple | 316.8 | 213.4 | 62.9 | 40.5 | -- |
| Cottonwood | 7.3 | 7.3 | -- | -- | -- |
| Maple-beech | 277.9 | 200.2 | 34.5 | 43.2 | -- |
| Cherry-ash-yellow-poplar | 180.2 | 117.3 | 23.2 | 39.7 | -- |
| Nonstocked | 22.2 | -- | -- | -- | 22.2 |
| All types | 1,123.2 | 753.4 | 193.6 | 154.0 | 22.2 |

Table 21.--Number of all live trees on timberland by species group and diameter class, Indiana, 1986

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | | | | | | | 29.0-39.0+ |
|--------------------|-------------|--|---------|---------|---------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----|--|--|------------|
| | | 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | | | | |
| Softwoods | | | | | | | | | | | | | | | | | | |
| Jack pine | 1,597 | 318 | 285 | 309 | 404 | 184 | 75 | 6 | 10 | 3 | | | | | | | | |
| Red pine | 1,421 | -- | -- | 546 | 619 | 244 | 12 | -- | -- | | | | | | | | | |
| White pine | 14,561 | 5,598 | 4,095 | 1,185 | 1,701 | 1,156 | 423 | 313 | 80 | 10 | | | | | | | | |
| Shortleaf pine | 4,370 | 489 | 228 | 931 | 1,483 | 907 | 236 | 87 | 9 | | | | | | | | | |
| Other yellow pines | 16,293 | 6,522 | 3,093 | 2,787 | 1,413 | 1,303 | 621 | 434 | 97 | 4 | 9 | 6 | 4 | | | | | |
| Tamarack | 330 | 72 | -- | 216 | -- | 31 | -- | -- | -- | | | | | | | | | |
| Baldcypress | 506 | -- | 45 | 47 | 127 | 143 | 49 | 58 | 21 | 15 | | | | | | | | |
| Eastern redcedar | 71,111 | 48,414 | 13,206 | 5,451 | 2,280 | 1,064 | 351 | 207 | 107 | 29 | | | 2 | 1 | | | | |
| Other softwoods | 3,696 | 675 | 1,062 | 1,260 | 614 | 85 | -- | -- | -- | | | | | | | | | |
| Total | 113,885 | 62,088 | 22,014 | 12,732 | 8,641 | 5,117 | 1,767 | 1,116 | 324 | 61 | 12 | 6 | 6 | 1 | | | | |
| Hardwoods | | | | | | | | | | | | | | | | | | |
| Select white oak | 61,641 | 17,616 | 9,216 | 5,809 | 6,617 | 5,343 | 4,666 | 3,801 | 3,017 | 2,114 | 1,400 | 885 | 860 | 257 | 40 | | | |
| Other white oak | 10,996 | 2,382 | 1,428 | 946 | 1,296 | 985 | 1,287 | 1,087 | 845 | 448 | 180 | 69 | 43 | -- | | | | |
| Select red oak | 22,850 | 6,942 | 2,835 | 2,221 | 2,122 | 1,622 | 1,420 | 1,793 | 1,158 | 953 | 683 | 401 | 491 | 187 | 22 | | | |
| Other red oak | 58,408 | 24,054 | 7,284 | 5,496 | 4,184 | 3,897 | 3,579 | 2,835 | 2,632 | 1,739 | 1,180 | 598 | 751 | 165 | 14 | | | |
| Select hickory | 51,215 | 19,044 | 9,609 | 6,134 | 5,234 | 4,332 | 2,625 | 1,986 | 1,201 | 591 | 263 | 107 | 84 | 5 | | | | |
| Other hickory | 58,996 | 23,322 | 9,801 | 7,312 | 6,691 | 4,334 | 3,374 | 1,996 | 1,083 | 541 | 291 | 125 | 114 | 12 | | | | |
| Basswood | 24,442 | 14,454 | 4,044 | 2,024 | 1,266 | 934 | 479 | 398 | 295 | 248 | 99 | 82 | 90 | 26 | 3 | | | |
| Beech | 41,502 | 24,861 | 5,526 | 2,779 | 1,701 | 1,310 | 1,185 | 870 | 680 | 710 | 532 | 416 | 691 | 227 | 14 | | | |
| Hard maple | 277,041 | 181,356 | 44,628 | 20,071 | 11,396 | 6,921 | 4,759 | 3,095 | 1,968 | 1,147 | 696 | 477 | 417 | 105 | 5 | | | |
| Soft maple | 92,445 | 51,126 | 16,809 | 8,298 | 5,545 | 3,493 | 2,671 | 1,532 | 1,058 | 697 | 412 | 285 | 384 | 102 | 33 | | | |
| Elm | 238,137 | 159,126 | 45,603 | 16,918 | 8,425 | 4,240 | 2,039 | 945 | 459 | 183 | 88 | 40 | 62 | 9 | | | | |
| Ash | 127,231 | 68,463 | 18,843 | 13,246 | 9,913 | 6,340 | 4,124 | 2,625 | 1,634 | 950 | 464 | 256 | 297 | 68 | 8 | | | |
| Sycamore | 16,058 | 3,573 | 1,941 | 2,700 | 1,605 | 1,814 | 1,267 | 967 | 637 | 464 | 409 | 222 | 338 | 112 | 9 | | | |
| Cottonwood | 7,230 | 1,401 | 1,263 | 552 | 731 | 676 | 537 | 624 | 383 | 348 | 175 | 115 | 284 | 120 | 21 | | | |
| Willow | 13,242 | 10,023 | 1,113 | 740 | 458 | 312 | 181 | 133 | 99 | 53 | 72 | 14 | 29 | 13 | 2 | | | |
| Hackberry | 32,530 | 20,157 | 5,460 | 2,960 | 1,409 | 983 | 658 | 349 | 245 | 139 | 76 | 47 | 42 | 2 | 3 | | | |
| Aspen | 6,616 | 2,601 | 1,356 | 830 | 475 | 479 | 341 | 272 | 195 | 48 | 10 | 6 | 2 | -- | 1 | | | |
| Birch | 7,362 | 4,059 | 1,728 | 719 | 336 | 261 | 47 | 105 | 69 | 29 | 4 | -- | 5 | -- | -- | | | |
| Sweetgum | 21,727 | 12,105 | 4,059 | 1,550 | 1,375 | 930 | 759 | 463 | 211 | 123 | 77 | 29 | 28 | 15 | 3 | | | |
| Tupelo | 30,010 | 20,358 | 4,695 | 1,625 | 1,222 | 957 | 442 | 324 | 141 | 116 | 53 | 29 | 45 | 3 | -- | | | |
| Black cherry | 70,926 | 43,206 | 13,362 | 5,129 | 3,671 | 2,188 | 1,673 | 649 | 477 | 301 | 130 | 80 | 42 | 18 | -- | | | |
| Black walnut | 25,975 | 7,737 | 4,605 | 3,323 | 3,655 | 2,357 | 1,728 | 1,060 | 813 | 386 | 178 | 62 | 56 | 12 | 3 | | | |
| Butternut | 531 | 123 | -- | 102 | 67 | 45 | 90 | 34 | 57 | 5 | 5 | -- | 3 | -- | -- | | | |
| Yellow-poplar | 59,731 | 27,516 | 8,868 | 5,405 | 3,832 | 3,520 | 2,668 | 2,501 | 1,910 | 1,590 | 864 | 494 | 492 | 65 | 6 | | | |
| Persimmon | 12,415 | 5,541 | 3,333 | 2,232 | 840 | 317 | 104 | 38 | 6 | 4 | -- | -- | -- | -- | -- | | | |
| Sassafras | 127,639 | 72,756 | 30,252 | 13,561 | 6,361 | 2,455 | 1,168 | 467 | 346 | 164 | 62 | 14 | 31 | 2 | -- | | | |
| Other hardwoods | 279,714 | 211,542 | 43,584 | 13,014 | 5,314 | 2,685 | 1,510 | 979 | 478 | 314 | 120 | 87 | 78 | 6 | 3 | | | |
| Noncommercial spp. | 207,195 | 164,448 | 31,416 | 7,775 | 2,199 | 782 | 255 | 165 | 83 | 43 | 14 | 5 | 4 | 6 | -- | | | |
| Total | 1,983,805 | 1,199,892 | 332,661 | 153,471 | 97,940 | 64,512 | 45,636 | 32,093 | 22,180 | 14,448 | 8,537 | 4,945 | 5,763 | 1,537 | 190 | | | |
| All species | 2,097,690 | 1,261,980 | 354,675 | 166,203 | 106,581 | 69,629 | 47,403 | 33,209 | 22,504 | 14,509 | 8,549 | 4,951 | 5,769 | 1,538 | 190 | | | |

Table 22.--Number of growing-stock trees on timberland by species group and diameter class, Indiana, 1986
(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | | | | | | | 29.0-39.0+ |
|--------------------|-------------|--|---------|---------|---------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----|----|----|------------|
| | | 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | | | | |
| Softwoods | | | | | | | | | | | | | | | | | | |
| Jack pine | 1,512 | 318 | 285 | 260 | 404 | 148 | 75 | 6 | 10 | 3 | 3 | -- | -- | -- | -- | -- | -- | -- |
| Red pine | 1,349 | -- | -- | 504 | 589 | 244 | 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 14,440 | 5,541 | 4,095 | 1,141 | 1,690 | 1,147 | 423 | 313 | 80 | 10 | -- | -- | -- | -- | -- | -- | -- | -- |
| Shortleaf pine | 4,133 | 489 | 228 | 886 | 1,426 | 806 | 206 | 83 | 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other yellow pines | 15,966 | 6,522 | 3,027 | 2,735 | 1,356 | 1,186 | 606 | 424 | 90 | 4 | 9 | 3 | 4 | -- | -- | -- | -- | -- |
| Tamarack | 330 | 72 | -- | 216 | -- | 31 | -- | 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Baldcypress | 505 | -- | 45 | 47 | 127 | 143 | 49 | 58 | 21 | 15 | -- | -- | -- | -- | -- | -- | -- | -- |
| Eastern redcedar | 69,318 | 48,006 | 13,011 | 5,243 | 1,890 | 717 | 253 | 141 | 45 | 10 | -- | -- | 2 | -- | -- | -- | -- | -- |
| Other softwoods | 3,186 | 675 | 810 | 1,114 | 519 | 68 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 110,739 | 61,623 | 21,501 | 12,146 | 8,001 | 4,490 | 1,624 | 1,036 | 255 | 42 | 12 | 3 | 6 | -- | -- | -- | -- | -- |
| Hardwoods | | | | | | | | | | | | | | | | | | |
| Select white oak | 57,924 | 17,544 | 8,757 | 5,227 | 6,253 | 4,947 | 4,142 | 3,403 | 2,831 | 1,941 | 1,290 | 759 | 668 | 150 | -- | 12 | -- | -- |
| Other white oak | 10,468 | 2,382 | 1,428 | 902 | 1,196 | 948 | 1,154 | 995 | 792 | 406 | 168 | 63 | 34 | -- | -- | -- | -- | -- |
| Select red oak | 21,855 | 6,942 | 2,772 | 2,123 | 2,086 | 1,479 | 1,349 | 1,644 | 1,059 | 881 | 612 | 376 | 398 | 127 | -- | 7 | -- | -- |
| Other red oak | 55,937 | 24,054 | 7,215 | 5,251 | 3,768 | 3,715 | 3,231 | 2,577 | 2,364 | 1,542 | 1,003 | 512 | 602 | 98 | -- | 5 | -- | -- |
| Select hickory | 49,415 | 19,044 | 9,132 | 5,967 | 4,918 | 4,191 | 2,460 | 1,786 | 1,042 | 506 | 222 | 88 | 55 | 4 | -- | -- | -- | -- |
| Other hickory | 56,897 | 23,259 | 9,546 | 6,976 | 6,292 | 4,139 | 3,052 | 1,747 | 949 | 511 | 241 | 102 | 78 | 5 | -- | -- | -- | -- |
| Basswood | 22,448 | 14,397 | 3,501 | 1,429 | 985 | 751 | 376 | 351 | 264 | 189 | 76 | 74 | 49 | 6 | -- | -- | -- | -- |
| Beech | 37,349 | 24,363 | 5,049 | 2,537 | 1,344 | 973 | 864 | 579 | 496 | 374 | 315 | 210 | 215 | 30 | -- | -- | -- | -- |
| Hard maple | 267,805 | 180,525 | 43,542 | 17,965 | 10,261 | 6,079 | 3,805 | 2,332 | 1,525 | 761 | 487 | 303 | 178 | 40 | -- | 2 | -- | -- |
| Soft maple | 85,004 | 50,844 | 15,369 | 6,607 | 4,551 | 2,892 | 1,622 | 1,152 | 767 | 488 | 277 | 147 | 221 | 60 | -- | 7 | -- | -- |
| Elm | 227,516 | 158,451 | 42,357 | 13,803 | 6,681 | 3,511 | 1,374 | 710 | 377 | 128 | 64 | 21 | 33 | 6 | -- | -- | -- | -- |
| Ash | 119,514 | 68,355 | 17,553 | 11,575 | 8,378 | 5,417 | 3,210 | 2,153 | 1,367 | 722 | 371 | 187 | 191 | 34 | -- | 1 | -- | -- |
| Sycamore | 15,043 | 3,573 | 1,941 | 2,587 | 1,453 | 1,633 | 1,123 | 840 | 583 | 434 | 335 | 201 | 255 | 78 | -- | 7 | -- | -- |
| Cottonwood | 6,591 | 1,401 | 1,119 | 503 | 635 | 589 | 483 | 535 | 378 | 338 | 145 | 99 | 260 | 91 | -- | 15 | -- | -- |
| Willow | 12,128 | 10,023 | 981 | 513 | 214 | 158 | 47 | 67 | 55 | 11 | 51 | 6 | 2 | -- | -- | -- | -- | -- |
| Hackberry | 30,277 | 19,749 | 5,043 | 2,268 | 1,200 | 770 | 554 | 285 | 173 | 116 | 63 | 37 | 19 | -- | -- | -- | -- | -- |
| Aspen | 6,396 | 2,601 | 1,356 | 773 | 412 | 407 | 331 | 254 | 195 | 48 | 10 | 6 | 2 | -- | -- | 1 | -- | -- |
| Birch | 7,228 | 4,059 | 1,692 | 673 | 336 | 246 | 24 | 105 | 69 | 17 | 4 | -- | 3 | -- | -- | -- | -- | -- |
| Sweetgum | 21,106 | 12,105 | 3,855 | 1,390 | 1,267 | 872 | 737 | 453 | 188 | 103 | 73 | 29 | 18 | 13 | -- | 3 | -- | -- |
| Tupelo | 29,309 | 20,358 | 4,695 | 1,443 | 1,080 | 747 | 405 | 263 | 102 | 100 | 53 | 26 | 34 | 3 | -- | -- | -- | -- |
| Black cherry | 64,177 | 43,206 | 11,685 | 3,461 | 2,290 | 1,496 | 956 | 435 | 333 | 129 | 116 | 52 | 18 | -- | -- | -- | -- | -- |
| Black walnut | 22,691 | 7,737 | 4,167 | 2,740 | 2,946 | 1,814 | 1,365 | 835 | 657 | 252 | 123 | 27 | 25 | 3 | -- | -- | -- | -- |
| Butternut | 387 | 123 | -- | 33 | 67 | 45 | 57 | 12 | 40 | 5 | 5 | -- | -- | -- | -- | -- | -- | -- |
| Yellow-poplar | 58,682 | 27,459 | 8,733 | 5,332 | 3,712 | 3,429 | 2,474 | 2,392 | 1,880 | 1,505 | 835 | 459 | 441 | 31 | -- | -- | -- | -- |
| Persimmon | 11,493 | 5,478 | 3,024 | 1,895 | 731 | 239 | 94 | 28 | -- | 4 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sassafras | 116,769 | 71,604 | 26,700 | 10,326 | 4,832 | 1,893 | 757 | 332 | 206 | 90 | 12 | 8 | 9 | -- | -- | -- | -- | -- |
| Other hardwoods | 255,202 | 208,659 | 35,196 | 6,079 | 2,571 | 1,344 | 607 | 423 | 171 | 77 | 14 | 34 | 26 | 1 | -- | -- | -- | -- |
| Total | 1,669,611 | 1,028,295 | 276,408 | 120,378 | 80,459 | 54,724 | 36,653 | 26,688 | 18,863 | 11,678 | 6,965 | 3,826 | 3,834 | 780 | 60 | -- | -- | -- |
| All species | 1,780,350 | 1,089,918 | 297,909 | 132,524 | 88,460 | 59,214 | 38,277 | 27,724 | 19,118 | 11,720 | 6,977 | 3,826 | 3,840 | 780 | 60 | -- | -- | -- |

Table 23.--Net volume of timber on timberland by class of timber
and species group, Indiana, 1986

(In thousand cubic feet)

| Class of timber | All species | Species group | | | |
|-------------------------|----------------|---------------|--------------------|-------------------|-------------------|
| | | Pine | Other softwoods | Soft hardwoods | Hard hardwoods |
| Live trees | | | | | |
| Growing-stock trees | | | | | |
| Sawtimber | | | | | |
| Saw log portion | 2,941,160 | 77,953 | 27,123 | 914,181 | 1,921,903 |
| Upper stem portion | 823,450 | 6,666 | 2,259 | 264,619 | 549,906 |
| Total | 3,764,610 | 84,619 | 29,382 | 1,178,800 | 2,471,809 |
| Poletimber | 1,453,244 | 53,684 | 33,577 | 519,204 | 846,779 |
| All growing-stock trees | 5,217,854 | 138,303 | 62,959 | 1,698,004 | 3,318,588 |
| Cull trees | | | | | |
| Short-log trees | 162,268 | 923 | 885 | 51,457 | 109,003 |
| Rough trees | | | | | |
| Sawtimber | 305,817 | 1,865 | 5,560 | 101,413 | 196,979 |
| Poletimber | 168,004 | 1,288 | 1,546 | 76,133 | 89,037 |
| Total | 473,821 | 3,153 | 7,106 | 177,546 | 286,016 |
| Rotten trees | | | | | |
| Sawtimber | 154,634 | -- | -- | 49,909 | 104,725 |
| Poletimber | 20,711 | 50 | 43 | 10,779 | 9,839 |
| Total | 175,345 | 50 | 43 | 60,688 | 114,564 |
| All cull trees | 811,434 | 4,126 | 8,034 | 289,691 | 509,583 |
| All live trees | 6,029,288 | 142,429 | 70,993 | 1,987,695 | 3,828,171 |
| Salvable dead trees | | | | | |
| Sawtimber | 52,654 | 1,652 | 852 | 11,100 | 15,739 |
| Poletimber | 29,343 | 1,533 | 1,299 | 13,688 | 36,134 |
| Total | 81,997 | 3,185 | 2,151 | 24,788 | 51,873 |
| All classes | 6,111,285 | 145,614 | 73,144 | 2,012,483 | 3,880,044 |

Table 24.--Net volume of growing stock in the saw-log portion of sawtimber trees on timberland by species group and diameter class, Indiana, 1986

| (In thousand cubic feet) | | | | | | | | | | | | | | |
|--------------------------|-------------|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------|-------|-----------|-------|----|
| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | 29.0-38.9 | 39.0+ | |
| | | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | | | | | |
| Softwoods | | | | | | | | | | | | | | |
| Jack pine | 3,141 | 1,300 | 1,158 | 119 | 285 | 141 | 138 | -- | -- | -- | -- | -- | -- | -- |
| Red pine | 2,046 | 1,890 | 156 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 25,805 | 9,718 | 5,944 | 7,062 | 2,663 | 418 | -- | -- | -- | -- | -- | -- | -- | -- |
| Shortleaf pine | 14,942 | 8,685 | 3,662 | 2,280 | 315 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other yellow pines | 31,210 | 9,816 | 8,743 | 8,806 | 2,744 | 177 | 437 | 176 | 311 | -- | -- | -- | -- | -- |
| Tamarack | 716 | 407 | -- | 309 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Baldcypress | 7,034 | 2,128 | 1,078 | 1,900 | 925 | 1,003 | -- | -- | -- | -- | -- | -- | -- | -- |
| Eastern redcedar | 19,373 | 7,754 | 4,784 | 4,056 | 1,875 | 704 | -- | -- | 200 | -- | -- | -- | -- | -- |
| Other softwoods | 809 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 105,076 | 42,507 | 25,525 | 24,532 | 8,807 | 2,443 | 575 | 176 | 511 | -- | -- | -- | -- | -- |
| Hardwoods | | | | | | | | | | | | | | |
| Select white oak | 437,844 | -- | 52,763 | 66,449 | 77,126 | 72,032 | 59,150 | 42,215 | 49,250 | 17,156 | 1,703 | -- | -- | -- |
| Other white oak | 81,471 | -- | 13,937 | 18,672 | 20,700 | 14,779 | 7,528 | 3,525 | 2,330 | -- | -- | -- | -- | -- |
| Select red oak | 200,159 | -- | 16,089 | 30,777 | 28,052 | 31,640 | 27,419 | 20,222 | 29,529 | 15,405 | 1,026 | -- | -- | -- |
| Other red oak | 329,385 | -- | 38,993 | 47,954 | 61,966 | 54,057 | 44,338 | 27,405 | 42,975 | 10,926 | 771 | -- | -- | -- |
| Select hickory | 143,671 | -- | 32,490 | 37,876 | 31,295 | 20,422 | 11,250 | 5,431 | 4,365 | 542 | -- | -- | -- | -- |
| Other hickory | 153,268 | -- | 41,274 | 36,663 | 28,810 | 20,434 | 12,364 | 6,605 | 6,315 | 803 | -- | -- | -- | -- |
| Basswood | 38,579 | -- | 4,800 | 7,002 | 7,333 | 7,274 | 3,601 | 4,202 | 3,727 | 640 | -- | -- | -- | -- |
| Beech | 92,575 | -- | 11,049 | 10,980 | 13,614 | 13,450 | 14,082 | 11,131 | 15,073 | 3,196 | -- | -- | -- | -- |
| Hard maple | 215,607 | -- | 47,310 | 45,029 | 41,244 | 26,853 | 21,471 | 16,669 | 12,373 | 4,334 | 324 | -- | -- | -- |
| Soft maple | 123,308 | -- | 20,613 | 22,297 | 20,234 | 16,949 | 12,001 | 7,763 | 15,097 | 7,098 | 1,256 | -- | -- | -- |
| Elm | 50,359 | -- | 16,453 | 13,069 | 9,954 | 4,306 | 2,716 | 1,062 | 2,211 | 588 | -- | -- | -- | -- |
| Ash | 179,348 | -- | 37,672 | 39,615 | 35,054 | 24,836 | 15,769 | 9,567 | 12,879 | 3,814 | 142 | -- | -- | -- |
| Sycamore | 140,002 | -- | 16,754 | 18,847 | 19,123 | 18,508 | 18,511 | 13,291 | 22,609 | 11,156 | 1,203 | -- | -- | -- |
| Cottonwood | 89,318 | -- | 6,532 | 11,975 | 10,148 | 13,199 | 7,059 | 6,340 | 19,963 | 11,240 | 2,862 | -- | -- | -- |
| Willow | 6,930 | -- | 625 | 1,548 | 1,596 | 427 | 2,159 | 384 | 191 | -- | -- | -- | -- | -- |
| Hackberry | 26,120 | -- | 6,548 | 5,110 | 4,323 | 4,100 | 2,708 | 1,881 | 1,450 | -- | -- | -- | -- | -- |
| Aspen | 16,932 | -- | 4,175 | 5,038 | 5,197 | 1,597 | 376 | 294 | 157 | -- | -- | -- | -- | -- |
| Birch | 4,829 | -- | 311 | 1,894 | 1,690 | 575 | 141 | -- | 218 | -- | -- | -- | -- | -- |
| Sweetgum | 33,901 | -- | 9,231 | 8,349 | 5,367 | 3,685 | 3,154 | 1,611 | 1,134 | 1,175 | 195 | -- | -- | -- |
| Tupelo | 23,744 | -- | 5,010 | 5,079 | 3,020 | 3,689 | 2,698 | 1,465 | 2,526 | 257 | -- | -- | -- | -- |
| Black cherry | 48,644 | -- | 12,617 | 9,242 | 10,407 | 5,437 | 6,098 | 3,251 | 1,592 | -- | -- | -- | -- | -- |
| Black walnut | 65,362 | -- | 17,251 | 15,671 | 17,066 | 8,184 | 4,580 | 1,174 | 1,254 | 182 | -- | -- | -- | -- |
| Butternut | 2,349 | -- | 752 | 217 | 1,051 | 168 | 161 | -- | -- | -- | -- | -- | -- | -- |
| Yellow-poplar | 280,281 | -- | 30,550 | 45,580 | 51,285 | 53,821 | 37,183 | 25,416 | 32,519 | 3,927 | -- | -- | -- | -- |
| Persimmon | 1,534 | -- | 977 | 432 | -- | 125 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sassafras | 24,814 | -- | 8,791 | 6,065 | 5,259 | 3,288 | 458 | 414 | 539 | -- | -- | -- | -- | -- |
| Other hardwoods | 25,750 | -- | 6,741 | 7,761 | 4,212 | 2,815 | 647 | 1,721 | 1,685 | 168 | -- | -- | -- | -- |
| Total | 2,836,084 | -- | 460,308 | 519,191 | 515,126 | 426,650 | 317,622 | 213,039 | 281,961 | 92,607 | 9,580 | -- | -- | -- |
| All species | 2,941,160 | 42,507 | 485,833 | 543,723 | 523,933 | 429,093 | 318,197 | 213,215 | 282,472 | 92,607 | 9,580 | -- | -- | -- |

Table 25.--Net volume of growing stock on timberland by species group and diameter class, Indiana, 1986

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ | |
|--------------------|-------------|--|---------|----------|-----------|-----------|-----------|-----------|-----------|---------|---------|-----------|-----------|-----------|-------|--|
| | | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | | | | | | | |
| Softwoods | | | | | | | | | | | | | | | | |
| Jack pine | 6,119 | 671 | 2,029 | 1,474 | 1,215 | 125 | 302 | 150 | 153 | -- | -- | -- | -- | -- | -- | |
| Red pine | 6,763 | 1,179 | 3,283 | 2,138 | 163 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| White pine | 39,757 | 2,788 | 9,068 | 10,998 | 6,237 | 7,414 | 2,808 | 444 | -- | -- | -- | -- | -- | -- | -- | |
| Shortleaf pine | 29,314 | 3,013 | 9,903 | 9,827 | 3,845 | 2,393 | 333 | -- | -- | -- | -- | -- | -- | -- | -- | |
| Other yellow pines | 46,661 | 6,109 | 6,867 | 11,111 | 9,173 | 9,242 | 2,892 | 188 | 485 | 200 | 394 | -- | -- | -- | -- | |
| Tamarack | 1,585 | 800 | -- | 461 | -- | 324 | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Baldcypress | 8,788 | 196 | 1,020 | 2,405 | 1,132 | 1,995 | 975 | 1,065 | -- | -- | -- | -- | -- | -- | -- | |
| Eastern redcedar | 52,586 | 17,415 | 14,146 | 8,775 | 5,020 | 4,256 | 1,974 | 747 | -- | -- | 253 | -- | -- | -- | -- | |
| Other softwoods | 9,689 | 4,461 | 4,313 | 915 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Total | 201,262 | 36,632 | 50,629 | 48,104 | 26,785 | 25,749 | 9,284 | 2,594 | 638 | 200 | 647 | -- | -- | -- | -- | |
| Hardwoods | | | | | | | | | | | | | | | | |
| Select white oak | 670,710 | 15,603 | 39,112 | 52,484 | 70,422 | 84,057 | 96,341 | 89,519 | 75,738 | 54,889 | 66,914 | 23,315 | 2,316 | -- | -- | |
| Other white oak | 123,634 | 2,636 | 7,180 | 9,974 | 18,597 | 23,625 | 25,860 | 18,374 | 9,638 | 4,584 | 3,166 | -- | -- | -- | -- | |
| Select red oak | 291,878 | 6,125 | 12,410 | 14,706 | 21,478 | 38,938 | 35,050 | 39,309 | 35,120 | 26,297 | 40,120 | 20,931 | 1,394 | -- | -- | |
| Other red oak | 497,322 | 14,106 | 21,499 | 37,714 | 52,041 | 60,656 | 77,408 | 67,185 | 56,788 | 35,633 | 58,395 | 14,851 | 1,046 | -- | -- | |
| Select hickory | 274,705 | 16,280 | 28,451 | 46,103 | 43,368 | 47,912 | 39,087 | 25,379 | 14,402 | 7,060 | 5,928 | 735 | -- | -- | -- | |
| Other hickory | 299,253 | 18,420 | 36,854 | 47,038 | 55,077 | 46,383 | 35,992 | 25,398 | 15,838 | 8,587 | 8,576 | 1,090 | -- | -- | -- | |
| Basswood | 67,070 | 3,891 | 5,684 | 8,029 | 6,406 | 8,862 | 9,163 | 9,036 | 4,609 | 5,463 | 5,059 | 868 | -- | -- | -- | |
| Beech | 145,972 | 7,570 | 8,123 | 10,590 | 14,749 | 13,889 | 17,008 | 16,713 | 18,038 | 14,473 | 20,479 | 4,340 | -- | -- | -- | |
| Hard maple | 454,732 | 51,110 | 62,034 | 64,259 | 63,140 | 56,969 | 51,526 | 33,387 | 27,492 | 21,673 | 16,817 | 5,885 | 440 | -- | -- | |
| Soft maple | 243,760 | 22,144 | 30,271 | 31,954 | 27,519 | 28,205 | 25,272 | 21,059 | 15,372 | 10,094 | 20,512 | 9,650 | 1,708 | -- | -- | |
| Elm | 174,074 | 36,697 | 37,658 | 34,778 | 21,962 | 16,532 | 12,436 | 5,350 | 3,478 | 1,379 | 3,003 | 801 | -- | -- | -- | |
| Ash | 359,677 | 30,259 | 45,945 | 52,912 | 50,286 | 50,126 | 43,780 | 30,861 | 20,194 | 12,442 | 17,500 | 5,179 | 193 | -- | -- | |
| Sycamore | 219,745 | 8,040 | 9,563 | 20,531 | 22,364 | 23,839 | 23,896 | 23,003 | 23,713 | 17,278 | 30,728 | 15,156 | 1,634 | -- | -- | |
| Cottonwood | 129,300 | 1,519 | 4,332 | 6,939 | 8,716 | 15,152 | 12,678 | 16,402 | 9,040 | 8,239 | 27,119 | 15,273 | 3,891 | -- | -- | |
| Willow | 13,501 | 1,216 | 1,505 | 1,939 | 833 | 1,959 | 1,993 | 531 | 2,765 | 500 | 260 | -- | -- | -- | -- | |
| Hackberry | 51,859 | 5,274 | 5,949 | 7,058 | 8,739 | 6,462 | 5,397 | 5,097 | 3,468 | 2,445 | 1,970 | -- | -- | -- | -- | |
| Aspen | 31,290 | 2,628 | 2,649 | 4,377 | 5,573 | 6,376 | 6,490 | 1,986 | 481 | 383 | 214 | -- | -- | -- | -- | |
| Birch | 12,538 | 1,822 | 1,957 | 2,645 | 415 | 2,394 | 2,111 | 716 | 181 | -- | 297 | -- | -- | -- | -- | |
| Sweetgum | 62,099 | 3,057 | 6,904 | 8,431 | 12,321 | 10,560 | 6,705 | 4,584 | 4,041 | 2,094 | 1,539 | 1,597 | 266 | -- | -- | |
| Tupelo | 46,152 | 3,369 | 5,104 | 7,078 | 6,683 | 6,421 | 3,770 | 4,584 | 3,458 | 1,907 | 3,429 | 349 | -- | -- | -- | |
| Black cherry | 102,003 | 8,745 | 14,257 | 16,522 | 16,841 | 11,693 | 12,995 | 6,753 | 7,809 | 4,227 | 2,161 | -- | -- | -- | -- | |
| Black walnut | 127,229 | 7,426 | 17,143 | 18,964 | 23,023 | 19,838 | 21,317 | 10,171 | 5,868 | 1,528 | 1,704 | 247 | -- | -- | -- | |
| Butternut | 3,981 | 128 | 418 | 430 | 1,004 | 275 | 1,311 | 209 | 206 | -- | -- | -- | -- | -- | -- | |
| Yellow-poplar | 432,602 | 14,641 | 22,137 | 36,250 | 40,772 | 57,667 | 64,059 | 66,877 | 47,625 | 33,050 | 44,187 | 5,337 | -- | -- | -- | |
| Persimmon | 12,010 | 4,335 | 3,406 | 2,265 | 1,303 | 546 | -- | 155 | -- | -- | -- | -- | -- | -- | -- | |
| Sassafras | 97,800 | 23,675 | 24,298 | 17,912 | 11,734 | 7,668 | 6,569 | 4,086 | 587 | 539 | 732 | -- | -- | -- | -- | |
| Other hardwoods | 71,696 | 12,720 | 13,076 | 12,746 | 8,999 | 9,816 | 5,260 | 3,498 | 827 | 2,239 | 2,287 | 228 | -- | -- | -- | |
| Total | 5,016,592 | 323,436 | 467,919 | 574,628 | 614,365 | 656,820 | 643,474 | 530,222 | 406,776 | 277,003 | 383,096 | 125,832 | 13,021 | -- | -- | |
| All species | 5,217,854 | 360,068 | 518,548 | 622,732 | 641,150 | 682,569 | 652,758 | 532,816 | 407,414 | 277,203 | 383,743 | 125,832 | 13,021 | -- | -- | |

Table 26.--Net volume of sawtimber on timberland by species group and diameter class, Indiana, 1986
(In thousand board feet)^{1/}

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | 29.0-39.0+ |
|--------------------|-------------|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|--------|------------|
| | | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | | | |
| Softwoods | | | | | | | | | | | | |
| Jack pine | 18,409 | 7,601 | 6,644 | 704 | 1,722 | 871 | 867 | -- | -- | -- | -- | -- |
| Red pine | 11,919 | 11,026 | 893 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 151,387 | 56,747 | 34,104 | 41,894 | 16,063 | 2,579 | -- | -- | -- | -- | -- | -- |
| Shortleaf pine | 87,129 | 50,686 | 21,019 | 13,521 | 1,903 | -- | -- | -- | -- | -- | -- | -- |
| Other yellow pines | 183,341 | 57,316 | 50,162 | 52,227 | 16,548 | 1,093 | 2,745 | 1,136 | 2,114 | -- | -- | -- |
| Tamarack | 4,208 | 2,377 | -- | 1,831 | -- | -- | -- | -- | -- | -- | -- | -- |
| Baldcypress | 41,635 | 12,411 | 6,189 | 11,265 | 5,583 | 6,187 | -- | -- | -- | -- | -- | -- |
| Eastern redcedar | 113,761 | 45,260 | 27,450 | 24,056 | 11,299 | 4,338 | -- | -- | 1,358 | -- | -- | -- |
| Other softwoods | 4,724 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 616,513 | 248,148 | 146,461 | 145,498 | 53,118 | 15,068 | 3,612 | 1,136 | 3,472 | -- | -- | -- |
| Hardwoods | | | | | | | | | | | | |
| Select white oak | 2,875,793 | -- | 345,526 | 431,290 | 503,212 | 471,879 | 392,096 | 280,441 | 326,321 | 113,721 | 11,307 | -- |
| Other white oak | 533,134 | -- | 91,276 | 121,194 | 135,086 | 96,825 | 49,896 | 23,411 | 15,446 | -- | -- | -- |
| Select red oak | 1,316,182 | -- | 105,383 | 199,781 | 183,072 | 207,238 | 181,782 | 134,347 | 195,693 | 102,084 | 6,802 | -- |
| Other red oak | 2,163,418 | -- | 255,361 | 311,246 | 404,356 | 354,139 | 293,960 | 182,026 | 284,801 | 72,428 | 5,101 | -- |
| Select hickory | 939,742 | -- | 212,812 | 245,835 | 204,186 | 133,774 | 74,561 | 36,069 | 28,921 | 3,584 | -- | -- |
| Other hickory | 1,003,171 | -- | 270,299 | 237,979 | 188,012 | 133,856 | 81,982 | 43,886 | 41,839 | 5,318 | -- | -- |
| Basswood | 253,100 | -- | 31,440 | 45,458 | 47,859 | 47,651 | 23,859 | 27,913 | 24,682 | 4,238 | -- | -- |
| Beech | 608,945 | -- | 72,371 | 71,277 | 88,837 | 88,099 | 93,368 | 73,937 | 99,882 | 21,174 | -- | -- |
| Hard maple | 1,413,239 | -- | 309,851 | 292,294 | 269,157 | 175,957 | 142,346 | 110,740 | 82,036 | 28,712 | 2,146 | -- |
| Soft maple | 809,358 | -- | 135,029 | 144,729 | 131,988 | 111,029 | 79,574 | 51,572 | 100,057 | 47,052 | 8,328 | -- |
| Elm | 329,362 | -- | 107,749 | 84,859 | 64,946 | 28,209 | 18,005 | 7,046 | 14,646 | 3,902 | -- | -- |
| Ash | 1,174,946 | -- | 246,716 | 257,205 | 228,685 | 162,697 | 104,521 | 63,570 | 85,345 | 25,265 | 942 | -- |
| Sycamore | 920,914 | -- | 109,723 | 122,326 | 124,834 | 121,252 | 122,751 | 88,291 | 149,847 | 73,922 | 7,968 | -- |
| Cottonwood | 587,853 | -- | 42,773 | 77,740 | 66,225 | 86,468 | 46,785 | 42,106 | 132,293 | 74,494 | 18,969 | -- |
| Willow | 45,497 | -- | 4,094 | 10,054 | 10,413 | 2,799 | 14,315 | 2,554 | 1,268 | -- | -- | -- |
| Hackberry | 171,147 | -- | 42,887 | 33,155 | 28,197 | 26,854 | 17,951 | 12,491 | 9,612 | -- | -- | -- |
| Aspen | 110,582 | -- | 27,347 | 32,716 | 33,918 | 10,466 | 2,490 | 1,954 | 1,042 | -- | -- | -- |
| Birch | 31,507 | -- | 2,036 | 12,295 | 11,023 | 3,772 | 934 | -- | 1,447 | -- | -- | -- |
| Sweetgum | 222,029 | -- | 60,449 | 54,195 | 35,025 | 24,150 | 20,914 | 10,698 | 7,511 | 7,789 | 1,298 | -- |
| Tupelo | 155,667 | -- | 32,794 | 32,956 | 19,691 | 24,164 | 17,891 | 9,740 | 16,730 | 1,701 | -- | -- |
| Black cherry | 318,703 | -- | 82,643 | 59,997 | 67,897 | 35,603 | 40,414 | 21,601 | 10,548 | -- | -- | -- |
| Black walnut | 427,405 | -- | 112,991 | 101,758 | 111,354 | 53,616 | 30,367 | 7,807 | 8,311 | 1,201 | -- | -- |
| Butternut | 15,368 | -- | 4,929 | 1,412 | 6,857 | 1,101 | 1,069 | -- | -- | -- | -- | -- |
| Yellow-poplar | 1,840,013 | -- | 200,080 | 295,847 | 334,647 | 352,563 | 246,507 | 168,830 | 215,507 | 26,032 | -- | -- |
| Persimmon | 10,011 | -- | 6,390 | 2,802 | -- | 819 | -- | -- | -- | -- | -- | -- |
| Sassafras | 162,154 | -- | 57,581 | 39,361 | 34,314 | 21,537 | 3,039 | 2,754 | 3,568 | -- | -- | -- |
| Other hardwoods | 168,454 | -- | 44,159 | 50,372 | 27,487 | 18,443 | 4,283 | 11,436 | 11,162 | 1,112 | -- | -- |
| Total | 18,607,694 | -- | 3,014,689 | 3,370,133 | 3,361,278 | 2,794,960 | 2,105,660 | 1,415,220 | 1,868,515 | 613,729 | 63,510 | -- |
| All species | 19,224,207 | 248,148 | 3,161,150 | 3,515,631 | 3,414,396 | 2,810,028 | 2,109,272 | 1,416,356 | 1,871,987 | 613,729 | 63,510 | -- |

^{1/} International 1/4-inch rule.

Table 27.--Net volume of live trees and growing stock on timberland by ownership class and species group, Indiana, 1986
(In thousand cubic feet)

| Ownership class | Live trees | | | | | Growing stock | | | | |
|-----------------------|-------------|---------|-----------------|----------------|----------------|---------------|---------|-----------------|----------------|----------------|
| | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods |
| National forest | 254,132 | 19,403 | 4,168 | 45,251 | 185,310 | 238,825 | 18,852 | 3,418 | 41,894 | 174,661 |
| Miscellaneous federal | 233,839 | 234 | 479 | 73,378 | 159,748 | 209,504 | 234 | 479 | 62,744 | 146,047 |
| State | 305,340 | 13,509 | 3,223 | 66,377 | 222,231 | 282,535 | 13,211 | 3,002 | 60,852 | 205,470 |
| County and municipal | 43,215 | -- | 176 | 21,336 | 21,703 | 36,332 | -- | 176 | 18,661 | 17,495 |
| Forest industry | 29,702 | -- | -- | 4,639 | 25,063 | 26,484 | -- | -- | 3,836 | 22,648 |
| Farmer | 2,385,968 | 38,538 | 29,107 | 884,352 | 1,433,971 | 2,006,762 | 37,841 | 24,587 | 737,712 | 1,206,622 |
| Misc. private-corp. | 522,104 | 25,906 | 4,535 | 173,911 | 317,752 | 449,452 | 25,076 | 4,399 | 147,238 | 277,739 |
| Misc. private-indiv. | 2,254,988 | 44,839 | 29,305 | 718,451 | 1,462,393 | 1,967,960 | 43,089 | 26,898 | 625,067 | 1,272,906 |
| All owners | 6,029,288 | 142,429 | 70,993 | 1,987,695 | 3,828,171 | 5,217,854 | 138,303 | 62,959 | 1,698,004 | 3,318,588 |

Table 28.--Net volume of growing stock and sawtimber on timberland by county and species group, Indiana, 1986

| Unit and county | Growing stock | | | | Sawtimber | | | |
|--------------------------|---------------------|---------------|-----------------|------------------|-----------------------------------|----------------|-----------------|------------------|
| | All species | Pine | Other softwoods | Hard hardwoods | All species | Pine | Other softwoods | Hard hardwoods |
| | Thousand cubic feet | | | | Thousand board feet ^{1/} | | | |
| Lower Wabash Unit | | | | | | | | |
| Clay | 54,350 | 2,139 | 683 | 31,653 | 201,560 | 7,336 | 3,187 | 118,580 |
| Daviess | 51,379 | 834 | 480 | 30,793 | 190,478 | 2,793 | 2,216 | 117,626 |
| Gibson | 49,000 | 1,129 | 663 | 27,732 | 176,850 | 3,862 | 3,089 | 102,609 |
| Greene | 124,809 | 4,199 | 1,638 | 72,135 | 452,848 | 14,001 | 7,761 | 271,205 |
| Knox | 34,410 | 224 | 119 | 21,459 | 125,878 | 712 | 437 | 79,207 |
| Martin | 182,406 | 768 | 173 | 122,717 | 707,052 | 1,713 | 456 | 484,067 |
| Parke | 113,973 | 3,278 | 2,044 | 62,109 | 413,849 | 11,729 | 9,692 | 227,809 |
| Pike | 106,030 | 2,499 | 1,529 | 60,209 | 384,936 | 8,848 | 7,229 | 223,125 |
| Posey | 60,703 | 765 | 482 | 37,243 | 229,581 | 2,704 | 2,188 | 143,012 |
| Putnam | 98,882 | 383 | 141 | 63,948 | 374,028 | 1,120 | 352 | 239,194 |
| Sullivan | 81,544 | 2,056 | 1,062 | 47,395 | 298,467 | 7,278 | 5,016 | 178,186 |
| Vanderburgh | 29,304 | 434 | 237 | 17,566 | 106,337 | 1,470 | 1,073 | 64,212 |
| Vermillion | 41,650 | 477 | 169 | 26,487 | 153,001 | 1,608 | 747 | 99,882 |
| Vigo | 58,801 | 1,197 | 686 | 33,921 | 211,903 | 4,074 | 3,181 | 125,270 |
| Total | 1,087,241 | 20,382 | 10,106 | 655,367 | 4,026,768 | 69,248 | 46,624 | 2,473,984 |
| Knobs Unit | | | | | | | | |
| Brown | 190,259 | 8,195 | 2,461 | 130,693 | 714,793 | 29,540 | 6,691 | 503,958 |
| Clark | 112,526 | 7,291 | 1,740 | 72,227 | 420,750 | 27,797 | 4,946 | 277,408 |
| Crawford | 157,423 | 4,623 | 2,146 | 108,425 | 582,098 | 15,055 | 5,262 | 413,273 |
| Dubois | 124,001 | 4,060 | 1,594 | 83,587 | 470,282 | 16,686 | 3,692 | 324,568 |
| Floyd | 47,433 | 1,374 | 543 | 30,995 | 180,034 | 5,916 | 1,206 | 118,104 |
| Harrison | 175,761 | 6,689 | 3,656 | 113,703 | 641,916 | 24,888 | 8,139 | 430,680 |
| Jackson | 159,454 | 5,021 | 2,711 | 106,900 | 575,103 | 13,959 | 6,485 | 403,301 |
| Lawrence | 180,706 | 3,411 | 1,620 | 129,795 | 687,495 | 12,534 | 4,411 | 504,105 |
| Monroe | 165,021 | 3,820 | 1,713 | 114,327 | 618,137 | 12,813 | 4,049 | 441,244 |
| Morgan | 109,257 | 3,048 | 1,986 | 72,221 | 401,468 | 10,326 | 4,788 | 273,022 |
| Orange | 176,616 | 6,318 | 3,205 | 119,969 | 648,722 | 19,654 | 8,536 | 455,875 |
| Owen | 140,177 | 4,755 | 2,055 | 89,970 | 528,332 | 20,687 | 4,748 | 340,683 |
| Perry | 213,369 | 12,765 | 3,221 | 146,368 | 778,940 | 38,823 | 9,271 | 555,799 |
| Scott | 55,632 | 2,236 | 924 | 36,650 | 205,427 | 8,010 | 2,247 | 140,403 |
| Spencer | 78,458 | 2,959 | 1,315 | 51,574 | 291,161 | 11,500 | 3,100 | 197,615 |
| Warrick | 95,835 | 4,284 | 2,011 | 59,023 | 340,965 | 13,605 | 4,750 | 220,181 |
| Washington | 159,816 | 7,721 | 2,246 | 100,594 | 603,222 | 33,974 | 4,898 | 380,987 |
| Total | 2,341,744 | 88,570 | 35,147 | 1,567,021 | 8,688,845 | 315,767 | 87,219 | 5,981,206 |
| Upland Flats Unit | | | | | | | | |
| Dearborn | 86,497 | 154 | 2,306 | 53,145 | 300,737 | 495 | 3,042 | 184,596 |
| Fayette | 25,332 | 92 | 442 | 15,749 | 81,280 | 426 | 775 | 49,024 |
| Franklin | 61,558 | 278 | 1,616 | 39,145 | 199,848 | 1,063 | 2,961 | 125,871 |
| Jefferson | 85,451 | 4,381 | 3,844 | 49,637 | 305,240 | 15,438 | 4,592 | 181,980 |
| Jennings | 82,835 | 170 | 2,082 | 50,608 | 288,264 | 674 | 3,101 | 174,484 |
| Ohio | 25,277 | 49 | 679 | 15,655 | 86,903 | 174 | 912 | 53,732 |
| Ripley | 76,125 | 2,648 | 2,759 | 46,352 | 271,884 | 9,438 | 3,628 | 168,764 |
| Switzerland | 90,286 | 151 | 1,364 | 57,726 | 341,015 | 602 | 1,059 | 217,682 |
| Union | 15,853 | 55 | 420 | 9,737 | 51,370 | 214 | 740 | 31,279 |
| Total | 549,214 | 7,978 | 15,512 | 337,754 | 1,926,541 | 28,524 | 20,810 | 1,187,412 |

(Table 28 continued on next page)

^{1/} International 14-inch rule.

(Table 28 continued)

| Unit and county | Growing stock | | | | | Sawtimber | | | | |
|-----------------|---------------|---------|-----------------|---------------------|----------------|-------------|---------|-----------------|---------------------|----------------|
| | All species | Pine | Other softwoods | Hardwoods | | All species | Pine | Other softwoods | Hardwoods | |
| | | | | Soft hardwoods | Hard hardwoods | | | | Soft hardwoods | Hard hardwoods |
| | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | | Thousand cubic feet | | | | | Thousand board feet | |
| Northern Unit | | | | | | | | | | |
| Adams | 16,408 | 220 | 38 | 5,997 | 10,153 | 61,593 | 451 | 91 | 21,026 | 40,025 |
| Allen | 26,954 | 591 | 32 | 10,026 | 16,305 | 96,699 | 1,296 | 22 | 32,849 | 62,532 |
| Bartholomew | 53,422 | 428 | 111 | 18,788 | 34,095 | 203,749 | 879 | 267 | 66,389 | 136,219 |
| Benton | 1,938 | 30 | 3 | 708 | 1,197 | 7,241 | 59 | 8 | 2,463 | 4,711 |
| Blackford | 12,009 | 50 | 29 | 4,127 | 7,803 | 46,569 | 97 | 74 | 14,906 | 31,492 |
| Boone | 17,396 | 70 | 46 | 5,937 | 11,343 | 66,503 | 142 | 108 | 20,781 | 45,472 |
| Carroll | 21,031 | 237 | 49 | 7,455 | 13,290 | 79,198 | 480 | 120 | 25,982 | 52,616 |
| Cass | 26,154 | 662 | 33 | 10,177 | 15,282 | 94,732 | 1,350 | 70 | 34,654 | 58,658 |
| Clinton | 11,342 | 34 | 27 | 3,690 | 7,591 | 44,083 | 75 | 66 | 13,207 | 30,735 |
| Decatur | 30,582 | 164 | 72 | 10,322 | 20,024 | 118,120 | 330 | 178 | 36,884 | 80,728 |
| De Kalb | 29,326 | 830 | 32 | 11,661 | 16,803 | 105,108 | 1,676 | 67 | 39,410 | 63,955 |
| Delaware | 16,516 | 368 | 20 | 6,219 | 9,909 | 59,820 | 755 | 30 | 20,762 | 38,273 |
| Elkhart | 30,309 | 570 | 81 | 11,437 | 18,221 | 110,484 | 1,146 | 203 | 38,812 | 70,323 |
| Fountain | 41,490 | 1,026 | 53 | 16,130 | 24,281 | 151,318 | 2,088 | 123 | 55,548 | 93,559 |
| Fulton | 22,328 | 478 | 31 | 8,532 | 13,287 | 81,940 | 994 | 65 | 29,399 | 51,482 |
| Grant | 22,802 | 296 | 47 | 8,119 | 14,340 | 86,318 | 591 | 116 | 28,643 | 56,968 |
| Hamilton | 21,539 | 481 | 48 | 8,176 | 12,834 | 77,697 | 937 | 115 | 27,288 | 49,357 |
| Hancock | 12,774 | 373 | 14 | 5,007 | 7,380 | 45,787 | 751 | 27 | 16,873 | 28,136 |
| Hendricks | 19,187 | 174 | 37 | 6,815 | 12,161 | 72,388 | 368 | 86 | 23,696 | 48,238 |
| Henry | 22,631 | 365 | 37 | 8,255 | 13,974 | 83,665 | 725 | 84 | 28,106 | 54,750 |
| Howard | 8,030 | 104 | 12 | 2,786 | 5,128 | 29,480 | 246 | 7 | 9,131 | 20,096 |
| Huntington | 23,195 | 621 | 21 | 8,827 | 13,726 | 83,370 | 1,285 | 25 | 29,101 | 52,959 |
| Jasper | 28,446 | 459 | 65 | 10,555 | 17,367 | 104,622 | 934 | 155 | 35,934 | 67,599 |
| Jay | 30,777 | 109 | 73 | 10,530 | 20,065 | 119,725 | 234 | 190 | 38,230 | 81,071 |
| Johnson | 24,206 | 101 | 55 | 8,241 | 15,809 | 93,398 | 203 | 138 | 29,390 | 63,667 |
| Kosciusko | 41,899 | 212 | 96 | 14,490 | 27,101 | 162,276 | 454 | 244 | 52,413 | 109,165 |
| La Grange | 34,854 | 728 | 45 | 13,430 | 20,651 | 124,862 | 1,410 | 100 | 44,087 | 79,265 |
| Lake | 20,362 | 378 | 36 | 7,578 | 12,370 | 74,951 | 742 | 83 | 25,851 | 48,275 |
| La Porte | 44,163 | 619 | 119 | 16,257 | 27,168 | 162,766 | 1,199 | 300 | 55,203 | 106,064 |
| Madison | 15,891 | 177 | 31 | 5,601 | 10,082 | 60,440 | 371 | 71 | 19,838 | 40,160 |
| Marion | 466 | -- | -- | 89 | 377 | 1,675 | -- | -- | 190 | 1,485 |
| Marshall | 32,896 | 608 | 48 | 12,497 | 19,743 | 121,437 | 1,281 | 107 | 43,267 | 76,782 |
| Miami | 32,495 | 278 | 70 | 11,441 | 20,706 | 124,540 | 557 | 178 | 40,900 | 82,905 |
| Montgomery | 25,962 | 780 | 26 | 10,087 | 15,069 | 92,788 | 1,598 | 30 | 33,747 | 57,413 |
| Newton | 22,640 | 436 | 39 | 8,429 | 13,736 | 84,216 | 865 | 90 | 29,384 | 53,877 |
| Noble | 33,525 | 823 | 39 | 12,876 | 19,788 | 120,885 | 1,691 | 60 | 43,149 | 75,985 |
| Porter | 31,638 | 733 | 52 | 11,989 | 18,864 | 112,945 | 1,382 | 121 | 39,047 | 72,395 |
| Pulaski | 29,497 | 655 | 50 | 11,265 | 17,527 | 107,732 | 1,346 | 113 | 38,583 | 67,690 |
| Randolph | 25,180 | 105 | 61 | 8,287 | 16,727 | 97,813 | 218 | 156 | 29,782 | 67,657 |
| Rush | 11,146 | 239 | 10 | 4,059 | 6,838 | 40,171 | 524 | 1 | 13,299 | 26,347 |
| St. Joseph | 22,949 | 509 | 53 | 8,822 | 13,565 | 82,525 | 1,010 | 130 | 29,470 | 51,915 |
| Shelby | 15,851 | 146 | 35 | 5,594 | 10,076 | 60,697 | 293 | 86 | 20,014 | 40,304 |
| Starke | 30,066 | 524 | 62 | 11,120 | 18,360 | 111,362 | 1,062 | 151 | 38,421 | 71,728 |
| Steuben | 32,116 | 803 | 38 | 12,370 | 18,905 | 115,318 | 1,636 | 60 | 41,185 | 72,437 |
| Tipecanoe | 23,654 | 730 | 21 | 9,280 | 13,623 | 84,092 | 1,497 | 23 | 30,902 | 51,670 |
| Tipton | 4,204 | 86 | 4 | 1,487 | 2,627 | 15,186 | 185 | 2 | 4,831 | 10,168 |
| Wabash | 24,763 | 570 | 34 | 9,339 | 14,820 | 88,725 | 1,097 | 69 | 30,550 | 57,009 |
| Warren | 27,035 | 385 | 52 | 9,798 | 16,800 | 101,332 | 798 | 120 | 34,187 | 66,227 |
| Wayne | 33,800 | 698 | 46 | 12,833 | 20,223 | 123,515 | 1,412 | 103 | 43,664 | 78,336 |
| Wells | 17,862 | 453 | 22 | 6,848 | 10,539 | 64,464 | 915 | 37 | 22,972 | 40,540 |
| White | 12,425 | 338 | 14 | 4,884 | 7,189 | 43,779 | 675 | 25 | 15,879 | 27,200 |
| Whitley | 21,524 | 519 | 26 | 8,375 | 12,604 | 77,949 | 1,060 | 56 | 28,446 | 48,387 |
| Total | 1,239,655 | 21,373 | 2,194 | 457,642 | 758,446 | 4,582,053 | 43,370 | 4,951 | 1,568,725 | 2,965,007 |
| All counties | 5,217,854 | 138,303 | 62,959 | 1,698,004 | 3,318,588 | 19,224,207 | 456,909 | 159,604 | 6,000,085 | 12,607,609 |

1/ International 1/4-inch rule.

Table 29.--Net volume of sawtimber on timberland by species group and butt log grade. Indiana, 1986

(In thousand board feet)^{1/}

| Species group | All species | Butt log grade | | | |
|--------------------|-------------|----------------|-----------|-----------|----------------|
| | | 1 | 2 | 3 | Tie and timber |
| Softwoods | | | | | |
| Jack pine | 18,409 | -- | -- | 18,409 | -- |
| Red pine | 11,919 | -- | -- | 11,919 | -- |
| White pine | 151,387 | 6,862 | 1,475 | 126,306 | 16,744 |
| Shortleaf pine | 87,129 | -- | 7,837 | 79,292 | -- |
| Other yellow pines | 183,341 | -- | 6,658 | 175,749 | 934 |
| Tamarack | 4,208 | -- | -- | 4,208 | -- |
| Baldcypress | 41,635 | -- | 2,098 | 39,537 | -- |
| Eastern redcedar | 113,761 | -- | 2,177 | 110,712 | 872 |
| Other softwoods | 4,724 | -- | -- | 4,724 | -- |
| Total | 616,513 | 6,862 | 20,245 | 570,856 | 18,550 |
| Hardwoods | | | | | |
| Select white oak | 2,875,793 | 457,221 | 781,401 | 1,016,708 | 620,463 |
| Other white oak | 533,134 | 15,331 | 99,798 | 229,002 | 189,003 |
| Select red oak | 1,316,182 | 89,266 | 187,078 | 387,335 | 652,503 |
| Other red oak | 2,163,418 | 110,707 | 260,533 | 569,454 | 1,222,724 |
| Select hickory | 939,742 | 31,885 | 99,488 | 310,018 | 498,351 |
| Other hickory | 1,003,171 | 46,503 | 145,824 | 375,600 | 435,244 |
| Basswood | 253,100 | 35,682 | 71,475 | 114,921 | 31,022 |
| Beech | 608,945 | -- | 4,637 | 48,263 | 556,045 |
| Hard maple | 1,413,239 | 39,780 | 134,478 | 488,919 | 750,062 |
| Soft maple | 809,358 | 5,742 | 68,788 | 203,212 | 531,616 |
| Elm | 329,362 | 20,241 | 70,656 | 156,033 | 82,432 |
| Ash | 1,174,946 | 155,788 | 336,442 | 491,615 | 191,101 |
| Sycamore | 920,914 | 203,738 | 256,111 | 320,924 | 140,141 |
| Cottonwood | 587,853 | 74,377 | 164,863 | 181,615 | 166,998 |
| Willow | 45,497 | 2,635 | 3,946 | 11,781 | 27,135 |
| Hackberry | 171,147 | 11,996 | 53,025 | 74,387 | 31,739 |
| Aspen | 110,582 | -- | 5,409 | 20,879 | 84,294 |
| Birch | 31,507 | 2,827 | 3,504 | 6,849 | 18,327 |
| Sweetgum | 222,029 | 14,347 | 48,417 | 79,708 | 79,557 |
| Tupelo | 155,667 | 11,453 | 31,317 | 42,258 | 70,639 |
| Black cherry | 318,703 | 17,220 | 60,998 | 122,139 | 118,346 |
| Black walnut | 427,405 | 46,038 | 126,987 | 214,268 | 40,112 |
| Butternut | 15,368 | -- | 3,658 | 9,197 | 2,513 |
| Yellow-poplar | 1,840,013 | 191,596 | 216,972 | 391,441 | 1,040,004 |
| Persimmon | 10,011 | -- | 1,909 | 8,102 | -- |
| Sassafras | 162,154 | 5,558 | 30,387 | 90,469 | 35,740 |
| Other hardwoods | 168,454 | 1,083 | 16,323 | 54,608 | 96,440 |
| Total | 18,607,694 | 1,591,014 | 3,284,424 | 6,019,705 | 7,712,551 |
| All species | 19,224,207 | 1,597,876 | 3,304,669 | 6,590,561 | 7,731,101 |

^{1/} International 1/4-inch rule.

Table 30.--Net annual growth of growing stock and sawtimber on timberland by county and species group, Indiana, 1985

| Unit and county | Growing stock | | | | Sawtimber | | | |
|--------------------------|---------------------|--------------|-----------------|----------------|-----------------------------------|---------------|-----------------|----------------|
| | All species | Pine | Other softwoods | Hard hardwoods | All species | Pine | Other softwoods | Hard hardwoods |
| | Thousand cubic feet | | | | Thousand board feet ^{1/} | | | |
| Lower Wabash Unit | | | | | | | | |
| Clay | 1,635 | 105 | 20 | 696 | 8,293 | 464 | 83 | 4,938 |
| Daviess | 1,522 | 40 | 9 | 714 | 7,045 | 227 | 20 | 4,082 |
| Gibson | 1,536 | 53 | 10 | 746 | 6,931 | 307 | 27 | 3,841 |
| Greene | 3,875 | 193 | 33 | 1,768 | 17,306 | 986 | 140 | 9,786 |
| Knox | 1,043 | 12 | 8 | 446 | 5,265 | 46 | 5 | 3,380 |
| Martin | 4,673 | 19 | 6 | 1,911 | 23,816 | 61 | 8 | 15,579 |
| Parke | 3,544 | 145 | 20 | 1,753 | 16,252 | 926 | 81 | 8,619 |
| Pike | 3,278 | 110 | 15 | 1,598 | 14,694 | 694 | 60 | 7,971 |
| Posey | 1,728 | 36 | 9 | 772 | 8,591 | 211 | 19 | 5,192 |
| Putnam | 2,811 | 30 | 9 | 1,098 | 16,013 | 61 | 10 | 10,918 |
| Sullivan | 2,473 | 93 | 17 | 1,157 | 11,208 | 528 | 62 | 6,234 |
| Vanderburgh | 917 | 20 | 4 | 409 | 4,367 | 106 | 11 | 2,700 |
| Vermillion | 1,247 | 22 | 6 | 529 | 5,783 | 102 | 17 | 3,641 |
| Vigo | 1,860 | 54 | 10 | 903 | 8,237 | 309 | 28 | 4,599 |
| Total | 32,142 | 932 | 176 | 14,500 | 153,801 | 5,028 | 571 | 91,480 |
| Knobs Unit | | | | | | | | |
| Brown | 5,261 | 212 | 89 | 1,893 | 27,360 | 1,640 | 538 | 16,151 |
| Clark | 3,452 | 245 | 68 | 1,292 | 17,252 | 933 | 349 | 9,175 |
| Crawford | 4,600 | 77 | 78 | 1,767 | 22,989 | 1,442 | 412 | 13,648 |
| Dubois | 3,727 | 186 | 69 | 1,369 | 19,040 | 740 | 401 | 11,385 |
| Floyd | 1,394 | 56 | 17 | 505 | 7,961 | 254 | 126 | 5,217 |
| Harrison | 5,593 | 275 | 150 | 2,232 | 25,693 | 1,294 | 442 | 14,008 |
| Jackson | 4,692 | 128 | 138 | 1,932 | 21,718 | 1,381 | 322 | 12,563 |
| Lawrence | 4,999 | 113 | 56 | 1,776 | 26,324 | 1,269 | 502 | 16,580 |
| Monroe | 4,811 | 143 | 85 | 1,830 | 23,521 | 661 | 475 | 14,665 |
| Morgan | 3,499 | 130 | 73 | 1,396 | 16,010 | 491 | 275 | 9,048 |
| Orange | 4,946 | 81 | 103 | 1,904 | 25,061 | 2,060 | 372 | 14,634 |
| Owen | 4,219 | 180 | 95 | 1,537 | 22,905 | 822 | 476 | 14,644 |
| Perry | 5,441 | 66 | 76 | 1,970 | 29,490 | 2,681 | 409 | 18,006 |
| Scott | 1,763 | 101 | 42 | 689 | 8,198 | 376 | 157 | 4,500 |
| Spencer | 2,477 | 136 | 67 | 963 | 11,357 | 545 | 232 | 6,326 |
| Warrick | 3,279 | 196 | 118 | 1,397 | 14,014 | 624 | 257 | 7,258 |
| Washington | 4,793 | 287 | 77 | 1,729 | 27,229 | 1,381 | 446 | 17,224 |
| Total | 68,946 | 2,612 | 1,401 | 26,181 | 346,122 | 18,594 | 6,191 | 205,032 |
| Upland Flats Unit | | | | | | | | |
| Dearborn | 2,699 | 5 | 121 | 1,100 | 9,668 | 11 | 31 | 5,299 |
| Fayette | 897 | 1 | 19 | 387 | 2,997 | 8 | -12 | 1,678 |
| Franklin | 2,175 | 7 | 97 | 856 | 7,406 | 19 | 18 | 4,292 |
| Jefferson | 2,402 | 97 | 114 | 899 | 9,598 | 271 | 58 | 5,278 |
| Jennings | 2,615 | 4 | 102 | 1,092 | 9,405 | 13 | 23 | 5,096 |
| Ohio | 808 | 1 | 38 | 329 | 2,843 | 3 | 8 | 1,582 |
| Ripley | 2,202 | 58 | 99 | 808 | 8,791 | 164 | 59 | 5,016 |
| Switzerland | 2,414 | 5 | 64 | 925 | 9,774 | 8 | 22 | 5,563 |
| Union | 555 | 1 | 23 | 229 | 1,878 | 4 | 5 | 1,037 |
| Total | 16,767 | 179 | 677 | 6,625 | 62,360 | 501 | 212 | 34,841 |

(Table 30 continued on next page)

^{1/} International 1/4-inch rule.

(Table 30 continued)

| Unit and county | Growing stock | | | | | Sawtimber | | | | |
|--------------------|---------------------|-------|--------------------|-------------------|-------------------|-----------------------------------|--------|--------------------|-------------------|-------------------|
| | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods |
| | Thousand cubic feet | | | | | Thousand board feet ^{1/} | | | | |
| Northern Unit | | | | | | | | | | |
| Adams | 462 | 7 | -- | 200 | 255 | 2,175 | 86 | -2 | 785 | 1,306 |
| Allen | 832 | 19 | 1 | 378 | 434 | 3,442 | 225 | -- | 1,209 | 2,008 |
| Bartholomew | 1,434 | 13 | 1 | 597 | 823 | 6,962 | 159 | -8 | 2,468 | 4,343 |
| Benton | 56 | 1 | -- | 24 | 31 | 253 | 12 | -- | 94 | 147 |
| Blackford | 310 | 1 | -- | 126 | 183 | 1,563 | 19 | -2 | 557 | 989 |
| Boone | 467 | 2 | -- | 193 | 272 | 2,191 | 24 | -3 | 776 | 1,394 |
| Carroll | 585 | 7 | -- | 250 | 328 | 2,726 | 92 | -3 | 983 | 1,654 |
| Cass | 788 | 20 | -- | 359 | 409 | 3,588 | 261 | -2 | 1,320 | 2,009 |
| Clinton | 292 | 1 | -- | 116 | 175 | 1,401 | 13 | -2 | 486 | 904 |
| Decatur | 796 | 4 | 1 | 322 | 469 | 3,891 | 62 | -5 | 1,377 | 2,457 |
| De Kalb | 901 | 25 | -- | 417 | 459 | 4,041 | 330 | -2 | 1,526 | 2,187 |
| Delaware | 496 | 11 | -- | 225 | 260 | 2,171 | 144 | -1 | 801 | 1,227 |
| Elkhart | 909 | 18 | 1 | 410 | 480 | 4,005 | 219 | -2 | 1,460 | 2,328 |
| Fountain | 1,236 | 31 | 1 | 560 | 644 | 5,711 | 412 | -4 | 2,125 | 3,178 |
| Fulton | 658 | 15 | -- | 294 | 349 | 3,022 | 189 | -2 | 1,105 | 1,730 |
| Grant | 625 | 8 | -- | 266 | 351 | 2,995 | 120 | -3 | 1,094 | 1,784 |
| Hamilton | 651 | 13 | 1 | 298 | 339 | 2,858 | 186 | -1 | 1,070 | 1,603 |
| Hancock | 392 | 11 | -- | 181 | 200 | 1,747 | 150 | -1 | 663 | 935 |
| Hendricks | 531 | 6 | -- | 225 | 300 | 2,482 | 62 | -3 | 872 | 1,551 |
| Henry | 648 | 11 | -- | 285 | 352 | 2,967 | 141 | -3 | 1,084 | 1,745 |
| Howard | 237 | 3 | -- | 104 | 130 | 964 | 39 | -- | 336 | 589 |
| Huntington | 709 | 19 | -- | 319 | 371 | 3,073 | 244 | -1 | 1,105 | 1,725 |
| Jasper | 834 | 15 | 1 | 370 | 448 | 3,741 | 173 | -2 | 1,343 | 2,227 |
| Jay | 793 | 3 | 1 | 319 | 470 | 3,989 | 43 | -6 | 1,406 | 2,546 |
| Johnson | 633 | 3 | 1 | 258 | 371 | 3,106 | 37 | -4 | 1,100 | 1,973 |
| Kosciusko | 1,092 | 6 | 1 | 444 | 641 | 5,469 | 83 | -7 | 1,933 | 3,460 |
| La Grange | 1,056 | 22 | -- | 484 | 550 | 4,591 | 274 | -3 | 1,724 | 2,596 |
| Lake | 589 | 11 | -- | 261 | 317 | 2,715 | 147 | -2 | 1,003 | 1,567 |
| La Porte | 1,282 | 19 | 1 | 567 | 695 | 5,767 | 228 | -4 | 2,088 | 3,455 |
| Madison | 432 | 5 | -- | 181 | 246 | 2,073 | 70 | -2 | 739 | 1,266 |
| Marion | 14 | -- | -- | 6 | 8 | 37 | -- | -- | 11 | 26 |
| Marshall | 959 | 20 | -- | 425 | 514 | 4,441 | 237 | -3 | 1,595 | 2,612 |
| Miami | 866 | 8 | 1 | 360 | 497 | 4,275 | 110 | -6 | 1,543 | 2,628 |
| Montgomery | 803 | 22 | 1 | 372 | 408 | 3,503 | 314 | -1 | 1,328 | 1,862 |
| Newton | 644 | 12 | -- | 283 | 349 | 3,059 | 176 | -3 | 1,143 | 1,743 |
| Noble | 1,016 | 24 | 1 | 463 | 528 | 4,480 | 322 | -2 | 1,656 | 2,504 |
| Porter | 959 | 21 | 1 | 440 | 497 | 4,174 | 278 | -2 | 1,578 | 2,320 |
| Pulaski | 879 | 20 | 1 | 396 | 462 | 3,978 | 260 | -2 | 1,463 | 2,257 |
| Randolph | 647 | 3 | -- | 258 | 386 | 3,155 | 42 | -4 | 1,105 | 2,012 |
| Rush | 341 | 8 | -- | 153 | 180 | 1,407 | 92 | -- | 497 | 818 |
| St. Joseph | 703 | 16 | 1 | 321 | 365 | 3,052 | 195 | -1 | 1,129 | 1,729 |
| Shelby | 425 | 4 | -- | 177 | 244 | 2,085 | 59 | -3 | 1,271 | 1,758 |
| Starke | 868 | 16 | 1 | 383 | 468 | 3,998 | 206 | -3 | 1,458 | 2,337 |
| Steuben | 981 | 24 | 1 | 450 | 506 | 4,270 | 316 | -2 | 1,597 | 2,359 |
| Tippecanoe | 738 | 22 | -- | 344 | 372 | 3,205 | 293 | -1 | 1,209 | 1,704 |
| Tipton | 128 | 3 | -- | 57 | 68 | 519 | 34 | -- | 187 | 298 |
| Wabash | 747 | 17 | -- | 341 | 389 | 3,262 | 216 | -2 | 1,224 | 1,824 |
| Warren | 761 | 12 | -- | 329 | 420 | 3,554 | 153 | -3 | 1,289 | 2,115 |
| Wayne | 995 | 21 | -- | 446 | 528 | 4,545 | 270 | -3 | 1,658 | 2,620 |
| Wells | 540 | 13 | -- | 281 | 246 | 2,393 | 180 | -1 | 902 | 1,312 |
| White | 392 | 10 | -- | 183 | 199 | 1,652 | 130 | -- | 619 | 903 |
| Whitley | 648 | 16 | -- | 295 | 337 | 2,938 | 203 | -2 | 1,077 | 1,660 |
| Total | 35,780 | 642 | 19 | 15,761 | 19,358 | 163,661 | 8,330 | -124 | 59,658 | 95,797 |
| All counties | 153,635 | 4,365 | 2,273 | 63,067 | 83,930 | 725,944 | 32,453 | 6,850 | 259,491 | 427,150 |

^{1/} International 1/4-inch rule.

Table 31.--Average annual timber removals from growing stock and sawtimber on timberland by county and species group, Indiana, 1966-1985

| Unit and county | Growing stock | | | | Sawtimber | | | | | |
|--------------------|----------------|------|--------------------|-------------------|-------------------|-----------------------------------|------|--------------------|-------------------|-------------------|
| | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods | Thousand board feet ^{1/} | | | | |
| | | | | | | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods |
| Lower Wabash Unit | | | | | | | | | | |
| Clay | 811 | -- | -- | 220 | 591 | 3,553 | -- | -- | 892 | 2,661 |
| Daviess | 849 | -- | 84 | 264 | 501 | 3,757 | -- | 459 | 1,087 | 2,211 |
| Gibson | 1,001 | -- | 170 | 308 | 523 | 4,436 | -- | 918 | 1,236 | 2,282 |
| Greene | 1,471 | -- | -- | 475 | 996 | 6,411 | -- | -- | 1,983 | 4,428 |
| Knox | 757 | -- | 82 | 204 | 471 | 3,284 | -- | 444 | 767 | 2,073 |
| Martin | 2,587 | -- | 34 | 759 | 1,794 | 11,877 | -- | 183 | 3,319 | 8,375 |
| Parke | 1,843 | -- | 114 | 625 | 1,104 | 8,126 | -- | 612 | 2,720 | 4,794 |
| Pike | 1,292 | -- | 12 | 427 | 853 | 5,696 | -- | 61 | 1,890 | 3,745 |
| Posey | 1,551 | -- | 179 | 520 | 852 | 6,923 | -- | 963 | 2,167 | 3,793 |
| Putnam | 1,756 | -- | 19 | 404 | 1,333 | 8,012 | -- | 106 | 1,690 | 6,216 |
| Sullivan | 1,166 | -- | 71 | 387 | 708 | 5,125 | -- | 383 | 1,629 | 3,113 |
| Vanderburgh | 489 | -- | 3 | 128 | 358 | 1,954 | -- | 16 | 484 | 1,454 |
| Vermillion | 564 | -- | 3 | 168 | 393 | 2,467 | -- | 16 | 678 | 1,773 |
| Vigo | 797 | -- | 16 | 249 | 532 | 3,403 | -- | 92 | 1,026 | 2,285 |
| Total | 16,934 | -- | 787 | 5,138 | 11,009 | 75,024 | -- | 4,253 | 21,568 | 49,203 |
| Knobs Unit | | | | | | | | | | |
| Brown | 2,994 | 7 | 11 | 305 | 2,671 | 12,877 | 29 | 34 | 1,265 | 11,549 |
| Clark | 1,247 | 3 | 4 | 183 | 1,057 | 5,436 | 15 | 14 | 759 | 4,648 |
| Crawford | 2,412 | 4 | 5 | 271 | 2,132 | 9,645 | 16 | 18 | 1,081 | 8,530 |
| Dubois | 1,375 | 6 | 15 | 187 | 1,167 | 6,153 | 28 | 41 | 797 | 5,287 |
| Floyd | 777 | 35 | 17 | 87 | 638 | 3,483 | 186 | 18 | 388 | 2,891 |
| Harrison | 1,764 | 5 | 17 | 331 | 1,411 | 7,575 | 26 | 82 | 1,359 | 6,108 |
| Jackson | 1,940 | 2 | 6 | 262 | 1,670 | 7,986 | 9 | 24 | 1,067 | 6,886 |
| Lawrence | 2,330 | 6 | 11 | 240 | 2,073 | 9,744 | 30 | 25 | 966 | 8,723 |
| Monroe | 4,194 | 6 | 12 | 398 | 3,778 | 17,000 | 30 | 27 | 1,625 | 15,318 |
| Morgan | 1,271 | 2 | 6 | 230 | 1,033 | 5,317 | 10 | 21 | 949 | 4,337 |
| Orange | 2,063 | 3 | 6 | 285 | 1,769 | 8,297 | 12 | 24 | 1,135 | 7,126 |
| Owen | 1,570 | 9 | 28 | 224 | 1,309 | 7,013 | 41 | 43 | 979 | 5,950 |
| Perry | 2,968 | 7 | 5 | 274 | 2,682 | 11,895 | 13 | 19 | 1,105 | 10,758 |
| Scott | 651 | 1 | 3 | 94 | 553 | 2,874 | 5 | 16 | 388 | 2,465 |
| Spencer | 910 | 2 | 5 | 133 | 770 | 3,913 | 9 | 21 | 543 | 3,340 |
| Warrick | 1,023 | 4 | 4 | 176 | 839 | 4,356 | 16 | 16 | 734 | 3,590 |
| Washington | 1,811 | 9 | 40 | 268 | 1,494 | 7,998 | 44 | 75 | 1,172 | 6,707 |
| Total | 31,300 | 111 | 195 | 3,948 | 27,046 | 131,562 | 519 | 518 | 16,312 | 114,213 |
| Upland Flats Unit | | | | | | | | | | |
| Dearborn | 673 | -- | 7 | 262 | 404 | 3,222 | -- | -- | 1,294 | 1,928 |
| Fayette | 182 | -- | 6 | 62 | 114 | 814 | -- | -- | 277 | 537 |
| Franklin | 421 | -- | 10 | 115 | 296 | 1,904 | -- | -- | 511 | 1,393 |
| Jefferson | 750 | -- | 12 | 151 | 587 | 3,533 | -- | -- | 690 | 2,843 |
| Jennings | 682 | -- | 9 | 272 | 401 | 3,213 | -- | -- | 1,332 | 1,881 |
| Ohio | 188 | -- | 2 | 70 | 116 | 900 | -- | -- | 339 | 561 |
| Ripley | 730 | -- | 15 | 135 | 580 | 3,349 | -- | -- | 587 | 2,762 |
| Switzerland | 898 | -- | 4 | 284 | 610 | 4,354 | -- | -- | 1,399 | 2,955 |
| Union | 123 | -- | 5 | 40 | 78 | 536 | -- | -- | 179 | 357 |
| Total | 4,647 | -- | 70 | 1,391 | 3,186 | 21,825 | -- | -- | 6,608 | 15,217 |

^{1/} International 1/4-inch rule.

(Table 31 continued on next page)

| Unit and county | Growing stock | | | | Sawtimber | | | |
|--------------------|---------------------|------|--------------------|-------------------|-----------------------------------|------|--------------------|-------------------|
| | All species | Pine | Other softwoods | Hard hardwoods | All species | Pine | Other softwoods | Hard hardwoods |
| | Thousand cubic feet | | | | Thousand board feet ^{1/} | | | |
| Northern Unit | | | | | | | | |
| Adams | 257 | -- | -- | 76 | 1,132 | -- | -- | 327 |
| Allen | 599 | 1 | -- | 218 | 2,596 | -- | -- | 905 |
| Bartholomew | 846 | -- | -- | 265 | 3,803 | -- | -- | 1,691 |
| Benton | 56 | -- | -- | 16 | 208 | -- | -- | 2,636 |
| Blackford | 190 | -- | -- | 59 | 857 | -- | -- | 148 |
| Boone | 335 | -- | -- | 107 | 1,490 | -- | -- | 595 |
| Carroll | 355 | -- | -- | 107 | 1,572 | -- | -- | 1,021 |
| Cass | 320 | 1 | -- | 91 | 1,363 | -- | -- | 1,110 |
| Clinton | 241 | -- | -- | 64 | 1,047 | -- | -- | 997 |
| Decatur | 549 | 1 | -- | 158 | 2,455 | -- | -- | 768 |
| De Kalb | 318 | 1 | -- | 91 | 1,345 | -- | -- | 1,752 |
| Delaware | 278 | -- | -- | 97 | 1,174 | -- | -- | 703 |
| Elkhart | 486 | 1 | -- | 130 | 2,128 | -- | -- | 359 |
| Fountain | 475 | 1 | -- | 138 | 2,064 | -- | -- | 986 |
| Fulton | 303 | -- | -- | 94 | 1,323 | -- | -- | 778 |
| Grant | 394 | -- | -- | 117 | 1,724 | -- | -- | 1,595 |
| Hamilton | 324 | -- | -- | 91 | 1,383 | -- | -- | 1,498 |
| Hancock | 160 | -- | -- | 48 | 660 | -- | -- | 928 |
| Hendricks | 320 | -- | -- | 99 | 1,414 | -- | -- | 1,227 |
| Henry | 351 | -- | -- | 107 | 1,513 | -- | -- | 1,016 |
| Howard | 235 | -- | -- | 90 | 1,022 | -- | -- | 477 |
| Huntington | 315 | 1 | -- | 107 | 1,339 | -- | -- | 183 |
| Jasper | 460 | -- | -- | 133 | 2,014 | -- | -- | 367 |
| Jay | 504 | -- | -- | 152 | 2,283 | -- | -- | 1,066 |
| Johnson | 400 | -- | -- | 126 | 1,801 | -- | -- | 984 |
| Kosciusko | 689 | 1 | -- | 212 | 3,107 | -- | -- | 434 |
| La Grange | 422 | 1 | -- | 229 | 1,789 | -- | -- | 559 |
| Lake | 425 | -- | -- | 127 | 1,768 | -- | -- | 1,455 |
| La Porte | 735 | 1 | -- | 202 | 3,232 | -- | -- | 1,605 |
| Madison | 311 | -- | -- | 91 | 1,344 | -- | -- | 1,244 |
| Marion | 463 | -- | -- | 146 | 1,928 | -- | -- | 2,166 |
| Marshall | 432 | -- | -- | 128 | 1,903 | -- | -- | 1,297 |
| Miami | 502 | -- | -- | 157 | 2,252 | -- | -- | 492 |
| Montgomery | 372 | 1 | -- | 129 | 1,566 | -- | -- | 1,270 |
| Newton | 316 | -- | -- | 99 | 1,364 | -- | -- | 850 |
| Noble | 476 | 1 | -- | 160 | 2,049 | -- | -- | 2,382 |
| Porter | 472 | 1 | -- | 133 | 1,958 | -- | -- | 386 |
| Pulaski | 405 | 1 | -- | 121 | 1,772 | -- | -- | 554 |
| Randolph | 487 | -- | -- | 129 | 2,161 | -- | -- | 541 |
| Rush | 227 | -- | -- | 82 | 977 | -- | -- | 691 |
| St. Joseph | 419 | 1 | -- | 114 | 1,777 | -- | -- | 518 |
| Shelby | 250 | -- | -- | 77 | 1,097 | -- | -- | 415 |
| Starke | 427 | -- | -- | 125 | 1,898 | -- | -- | 1,385 |
| Steuben | 445 | 1 | -- | 152 | 1,919 | -- | -- | 1,438 |
| Tippecanoe | 333 | 1 | -- | 111 | 1,387 | -- | -- | 506 |
| Tipton | 95 | -- | -- | 34 | 399 | -- | -- | 570 |
| Wabash | 340 | 1 | -- | 102 | 1,418 | -- | -- | 346 |
| Warren | 411 | -- | -- | 131 | 1,832 | -- | -- | 631 |
| Wayne | 471 | 1 | -- | 137 | 2,042 | -- | -- | 449 |
| Wells | 263 | -- | -- | 89 | 1,104 | -- | -- | 332 |
| White | 196 | -- | -- | 58 | 792 | -- | -- | 529 |
| Whitley | 254 | -- | -- | 71 | 1,085 | -- | -- | 624 |
| Total | 19,709 | 19 | -- | 6,020 | 85,630 | -- | -- | 948 |
| All counties | 72,590 | 130 | 1,052 | 16,497 | 314,041 | 519 | 4,771 | 261 |
| | | | | | | | | 1,012 |
| | | | | | | | | 566 |
| | | | | | | | | 1,266 |
| | | | | | | | | 1,478 |
| | | | | | | | | 744 |
| | | | | | | | | 567 |
| | | | | | | | | 799 |
| | | | | | | | | 60,435 |
| | | | | | | | | 239,068 |

^{1/} International 1/4-inch rule.

Table 32.--Net annual growth and current annual timber removals from growing stock on timberland by species group and Forest Survey Unit, Indiana, 1985

(In thousand cubic feet)

| Species group | Growth | | | | Removals | | | | | |
|------------------|-----------|-------------------|------------|-------------------|---------------|-----------|-------------------|------------|-------------------|---------------|
| | All Units | Lower Wabash Unit | Knobs Unit | Upland Flats Unit | Northern Unit | All Units | Lower Wabash Unit | Knobs Unit | Upland Flats Unit | Northern Unit |
| Softwoods | | | | | | | | | | |
| Pine | 3,838 | 932 | 2,331 | 179 | 396 | 184 | 2 | 151 | 1/ | 31 |
| Baldcypress | 138 | 119 | 19 | -- | -- | -- | -- | -- | -- | -- |
| Eastern redcedar | 2,133 | 57 | 1,382 | 677 | 17 | 119 | 1 | 101 | 17 | -- |
| Other softwoods | 529 | -- | 281 | -- | 248 | -- | -- | -- | -- | -- |
| Total | 6,638 | 1,108 | 4,013 | 856 | 661 | 303 | 3 | 252 | 17 | 31 |
| Hardwoods | | | | | | | | | | |
| Select white oak | 15,350 | 2,735 | 8,369 | 1,479 | 2,767 | 12,310 | 2,804 | 5,191 | 796 | 3,519 |
| Other white oak | 2,425 | 83 | 2,334 | 1 | 7 | 2,700 | 162 | 2,306 | 12 | 220 |
| Select red oak | 8,276 | 1,686 | 3,386 | 830 | 2,374 | 9,976 | 2,089 | 4,366 | 726 | 2,795 |
| Other red oak | 14,388 | 3,316 | 7,257 | 968 | 2,847 | 17,035 | 3,836 | 9,200 | 744 | 3,255 |
| Select hickory | 5,583 | 1,354 | 1,937 | 640 | 1,652 | 3,397 | 1,101 | 1,320 | 106 | 870 |
| Other hickory | 6,402 | 1,548 | 2,511 | 952 | 1,391 | 3,625 | 1,142 | 1,800 | 162 | 521 |
| Basswood | 1,693 | 250 | 124 | 197 | 1,122 | 935 | 147 | 156 | 66 | 566 |
| Beech | 1,504 | 61 | 900 | 177 | 366 | 3,426 | 496 | 1,410 | 333 | 1,187 |
| Hard maple | 13,833 | 2,249 | 7,127 | 1,816 | 2,641 | 5,437 | 882 | 2,646 | 203 | 1,706 |
| Soft maple | 12,287 | 3,472 | 4,951 | 744 | 3,120 | 3,150 | 854 | 771 | 184 | 1,341 |
| Elm | 4,654 | 452 | 362 | 581 | 3,259 | 888 | 260 | 247 | 10 | 371 |
| Ash | 10,079 | 2,002 | 3,132 | 1,514 | 3,431 | 7,781 | 1,878 | 2,448 | 696 | 2,759 |
| Sycamore | 6,232 | 1,658 | 2,688 | 653 | 1,233 | 3,242 | 815 | 1,079 | 212 | 1,136 |
| Cottonwood | 3,789 | 972 | 478 | 99 | 2,240 | 1,920 | 508 | 304 | 160 | 948 |
| Aspen | 728 | 52 | 517 | 120 | 39 | 285 | 24 | 65 | 15 | 181 |
| Birch | 450 | 193 | 202 | -- | 55 | 332 | 41 | 221 | 19 | 51 |
| Sweetgum | 3,203 | 680 | 1,589 | 879 | 55 | 1,049 | 279 | 486 | 221 | 63 |
| Tupelo | 1,134 | 295 | 603 | 228 | 8 | 538 | 143 | 282 | 88 | 25 |
| Black cherry | 2,961 | 511 | 944 | 325 | 1,181 | 1,519 | 321 | 476 | 86 | 636 |
| Black walnut | 3,959 | 927 | 883 | 707 | 1,442 | 1,924 | 496 | 479 | 153 | 796 |
| Yellow-poplar | 20,032 | 4,918 | 10,946 | 2,171 | 1,997 | 9,663 | 2,816 | 5,192 | 604 | 1,051 |
| Other hardwoods | 8,035 | 1,620 | 3,693 | 830 | 1,892 | 1,390 | 359 | 282 | 68 | 681 |
| Total | 146,997 | 31,034 | 64,933 | 15,911 | 35,119 | 92,522 | 21,453 | 40,727 | 5,664 | 24,678 |
| All species | 153,635 | 32,142 | 68,946 | 16,767 | 35,780 | 92,825 | 21,456 | 40,979 | 5,681 | 24,709 |

1/ Less than 500 cubic feet.

Table 33.--Net annual growth and current annual timber removals from sawtimber on timberland by species group and Forest Survey Unit, Indiana, 1985

(In thousand board feet)^{1/}

| Species group | Growth | | | | Removals | | | | | |
|------------------|-----------|-------------------|------------|-------------------|---------------|-----------|-------------------|------------|-------------------|---------------|
| | All Units | Lower Wabash Unit | Knobs Unit | Upland Flats Unit | Northern Unit | All Units | Lower Wabash Unit | Knobs Unit | Upland Flats Unit | Northern Unit |
| Softwoods | | | | | | | | | | |
| Pine | 28,868 | 5,028 | 18,343 | 501 | 4,996 | 826 | 14 | 721 | 2 | 89 |
| Baldcypress | 744 | 643 | 101 | -- | -- | -- | -- | -- | -- | -- |
| Eastern redcedar | 6,237 | -72 | 6,090 | 212 | 7 | 231 | 5 | 179 | 47 | -- |
| Other softwoods | 3,454 | -- | 251 | -- | 3,203 | -- | -- | -- | -- | -- |
| Total | 39,303 | 5,599 | 24,785 | 713 | 8,206 | 1,057 | 19 | 900 | 49 | 89 |
| Hardwoods | | | | | | | | | | |
| Select white oak | 79,020 | 12,302 | 48,329 | 5,639 | 12,750 | 61,583 | 14,125 | 25,305 | 4,208 | 17,945 |
| Other white oak | 13,109 | 742 | 12,192 | -24 | 199 | 12,740 | 695 | 10,908 | 47 | 1,090 |
| Select red oak | 50,361 | 8,458 | 17,443 | 4,365 | 20,095 | 51,242 | 10,702 | 22,166 | 3,947 | 14,427 |
| Other red oak | 77,947 | 17,130 | 41,071 | 3,870 | 15,876 | 86,148 | 19,477 | 47,087 | 3,798 | 15,786 |
| Select hickory | 28,196 | 9,622 | 8,735 | 3,547 | 6,292 | 16,538 | 5,522 | 6,408 | 533 | 4,075 |
| Other hickory | 35,440 | 11,171 | 16,989 | 3,185 | 4,095 | 17,140 | 5,633 | 8,213 | 788 | 2,506 |
| Basswood | 9,019 | 2,651 | 795 | 1,537 | 4,036 | 4,452 | 763 | 739 | 351 | 2,599 |
| Beech | 5,676 | 400 | 3,301 | 402 | 1,573 | 17,612 | 2,581 | 7,195 | 1,700 | 6,136 |
| Hard maple | 59,429 | 14,850 | 32,476 | 3,776 | 8,327 | 25,614 | 4,230 | 12,196 | 902 | 8,286 |
| Soft maple | 36,743 | 15,176 | 11,058 | 1,882 | 8,627 | 15,098 | 4,171 | 3,736 | 921 | 6,270 |
| Elm | 6,401 | 53 | 1,246 | 306 | 4,796 | 3,929 | 1,313 | 1,009 | 44 | 1,563 |
| Ash | 49,560 | 6,306 | 16,259 | 6,756 | 20,239 | 36,840 | 9,105 | 11,284 | 3,295 | 13,156 |
| Sycamore | 31,449 | 7,065 | 15,371 | 3,611 | 5,402 | 16,304 | 4,016 | 5,419 | 1,123 | 5,746 |
| Cottonwood | 19,464 | 4,536 | 2,651 | 395 | 11,882 | 11,072 | 2,949 | 1,660 | 943 | 5,520 |
| Aspen | 5,517 | -- | 4,602 | 370 | 545 | 1,078 | 127 | 271 | 81 | 599 |
| Birch | 1,262 | 426 | 798 | -- | 38 | 1,679 | 227 | 1,085 | 99 | 268 |
| Sweetgum | 11,577 | 1,331 | 6,916 | 3,221 | 109 | 5,410 | 1,397 | 2,558 | 1,162 | 293 |
| Tupelo | 5,201 | 435 | 3,678 | 1,031 | 57 | 2,748 | 711 | 1,436 | 462 | 139 |
| Black cherry | 16,699 | 1,724 | 8,857 | 1,311 | 4,807 | 7,761 | 1,673 | 2,464 | 453 | 3,171 |
| Black walnut | 19,928 | 6,405 | 6,323 | 3,021 | 4,179 | 11,003 | 2,993 | 2,865 | 987 | 4,158 |
| Yellow-poplar | 90,476 | 19,746 | 54,629 | 8,630 | 7,471 | 50,667 | 14,714 | 27,323 | 3,185 | 5,445 |
| Other hardwoods | 34,167 | 7,673 | 7,618 | 4,816 | 14,060 | 4,495 | 1,012 | 995 | 240 | 2,248 |
| Total | 686,641 | 148,202 | 321,337 | 61,647 | 155,455 | 461,153 | 108,136 | 202,322 | 29,269 | 121,426 |
| All species | 725,944 | 153,801 | 346,122 | 62,360 | 163,661 | 462,210 | 108,155 | 203,222 | 29,318 | 121,515 |

^{1/} International 1/4-inch rule.

Table 34.--Net annual growth and current annual timber removals of growing stock on timberland by ownership class and species group, Indiana, 1985

(In thousand cubic feet)

| Ownership class | Growth | | | | | Removals | | | | |
|--------------------------|-------------|-------|-----------------|----------------|----------------|-------------|------|-----------------|----------------|----------------|
| | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods |
| National forest | 4,220 | -251 | 13 | 1,523 | 2,935 | 3,897 | 8 | -- | 221 | 3,668 |
| Miscellaneous federal | 5,889 | 5 | 11 | 2,423 | 3,450 | 407 | -- | -- | 40 | 367 |
| State | 7,106 | 570 | -5 | 2,284 | 4,257 | 1,701 | 4 | 8 | 262 | 1,427 |
| County and municipal | 947 | -- | 8 | 538 | 401 | 56 | 16 | -- | 28 | 12 |
| Forest industry | 538 | -- | -- | 95 | 443 | 1,103 | 1 | -- | 60 | 1,042 |
| Farmer and other private | 134,935 | 4,041 | 2,246 | 56,204 | 72,444 | 85,661 | 155 | 111 | 23,968 | 61,427 |
| All ownerships | 153,635 | 4,365 | 2,273 | 63,067 | 83,930 | 92,825 | 184 | 119 | 24,579 | 67,943 |

Table 35.--Net annual growth and current annual timber removals of sawtimber on timberland by ownership class and species group, Indiana, 1985

(In thousand board feet)^{1/}

| Ownership class | Growth | | | | Removals | | | | | |
|--------------------------|-------------|--------|-----------------|----------------|----------------|-------------|------|-----------------|----------------|----------------|
| | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods | All species | Pine | Other softwoods | Soft hardwoods | Hard hardwoods |
| National forest | 28,429 | 7,208 | 80 | 2,820 | 18,321 | 17,502 | 32 | -- | 957 | 16,513 |
| Miscellaneous federal | 27,214 | 25 | 16 | 10,652 | 16,521 | 2,001 | -- | -- | 214 | 1,787 |
| State | 27,323 | 2,006 | -176 | 7,301 | 18,192 | 8,265 | 24 | 36 | 1,244 | 6,961 |
| County and municipal | 4,613 | -- | -- | 2,400 | 2,213 | 20 | -- | -- | 14 | 6 |
| Forest industry | 2,772 | -- | -- | -222 | 2,994 | 5,876 | 6 | -- | 324 | 5,546 |
| Farmer and other private | 635,593 | 23,214 | 6,930 | 236,540 | 368,909 | 428,546 | 764 | 195 | 120,261 | 307,326 |
| All ownerships | 725,944 | 32,453 | 6,850 | 259,491 | 427,150 | 462,210 | 826 | 231 | 123,014 | 338,139 |

^{1/} International 1/4-inch rule.

Table 36.--Annual mortality of growing stock and sawtimber
on timberland by species group, Indiana, 1985

| Species group | Growing stock | Sawtimber |
|--------------------|------------------------|--------------------------------------|
| | Thousand cubic feet | Thousand board feet ^{1/} |
| Softwoods | | |
| Jack pine | 42 | 160 |
| Red pine | 16 | 34 |
| White pine | 197 | 243 |
| Shortleaf pine | 812 | 931 |
| Other yellow pines | 531 | 1,215 |
| Tamarack | 46 | 249 |
| Baldcypress | 156 | 703 |
| Eastern redcedar | 329 | 988 |
| Other softwoods | 51 | 9 |
| Total | 2,180 | 4,532 |
| Hardwoods | | |
| Select white oak | 1,548 | 5,140 |
| Other white oak | 548 | 1,903 |
| Select red oak | 1,465 | 5,737 |
| Other red oak | 3,139 | 11,857 |
| Select hickory | 1,264 | 3,866 |
| Other hickory | 1,472 | 4,314 |
| Basswood | 509 | 1,278 |
| Beech | 515 | 1,945 |
| Hard maple | 2,022 | 5,302 |
| Soft maple | 2,237 | 6,757 |
| Elm | 4,275 | 9,453 |
| Ash | 2,195 | 5,561 |
| Sycamore | 1,761 | 6,902 |
| Cottonwood | 956 | 3,944 |
| Willow | 581 | 2,088 |
| Hackberry | 1,004 | 2,787 |
| Aspen | 739 | 1,598 |
| Birch | 94 | 45 |
| Sweetgum | 615 | 1,929 |
| Tupelo | 228 | 814 |
| Black cherry | 1,754 | 2,729 |
| Black walnut | 1,146 | 1,964 |
| Butternut | 135 | 454 |
| Yellow-poplar | 1,005 | 4,264 |
| Persimmon | 282 | 93 |
| Sassafras | 1,994 | 1,702 |
| Other hardwoods | 1,862 | 2,291 |
| Total | 35,345 | 96,717 |
| All species | 37,525 | 101,249 |

^{1/} International 1/4-inch rule.

Table 37.--Removals,^{1/} net annual growth, and inventory of growing stock on timberland, Indiana, 1986, and low removals option projections^{2/} to 2016

(In million cubic feet)

| Year | All species | | |
|------|-------------|--------|-----------|
| | Removals | Growth | Inventory |
| 1986 | 92.8 | 153.6 | 5,217.9 |
| 1996 | 104.6 | 170.6 | 5,883.3 |
| 2006 | 113.4 | 188.3 | 6,494.9 |
| 2016 | 119.0 | 203.3 | 7,014.5 |

^{1/}Timber removals include volume "lost" due to land clearing, flooding, thinning, or changes in land use, in addition to timber cut and used.

^{2/}Based on the following assumptions: (a) that the area of timberland will decline but at an insignificant rate; (b) that radial growth will decline over time in relation to increased stand density; (c) that the intensity of forest management practised will continue at the rate indicated by recent trends; and (d) that the volume of "other" removals will drop during the period as more of these trees are utilized.

Table 38.--Removals,^{1/} net annual growth, and inventory of growing stock on timberland, Indiana, 1986, and high removals option projections^{2/} to 2016

(In million cubic feet)

| Year | All species | | |
|------|-------------|--------|-----------|
| | Removals | Growth | Inventory |
| 1986 | 92.8 | 153.6 | 5,217.9 |
| 1996 | 128.9 | 165.7 | 5,758.7 |
| 2006 | 160.5 | 172.5 | 5,941.1 |
| 2016 | 181.5 | 165.5 | 5,706.5 |

^{1/}Timber removals include volume "lost" due to land clearing, flooding, thinning, or changes in land use, in addition to timber cut and used.

^{2/}Based on the following assumptions: (a) that the area of timberland will decline but at an insignificant rate; (b) that radial growth will decline over time in relation to increased stand density; (c) that the intensity of forest management practised will continue at the rate indicated by recent trends; and (d) that the volume of "other" removals will drop during the period as more of these trees are utilized.

Table 39.--Sampling errors for Forest Survey Unit and county totals of volume, net annual growth, average annual removals, and area of timberland, Indiana, 1986

(In percent)

| Unit and county | Area | Growing stock | | | Sawtimber | | |
|-------------------|-------|---------------|--------|------------------------|-----------|--------|----------|
| | | Volume | Growth | Removals ^{2/} | Volume | Growth | Removals |
| Lower Wabash Unit | | | | | | | |
| Clay | 11.11 | 15.76 | 21.69 | 55.98 | 18.42 | 12.59 | 57.45 |
| Daviess | 11.46 | 16.21 | 22.69 | 54.71 | 18.94 | 14.10 | 55.87 |
| Gibson | 11.41 | 16.60 | 22.52 | 50.38 | 19.66 | 14.34 | 51.42 |
| Greene | 7.20 | 10.38 | 13.99 | 41.57 | 12.29 | 8.93 | 42.77 |
| Knox | 13.32 | 19.81 | 27.71 | 57.93 | 23.30 | 15.90 | 59.76 |
| Martin | 6.52 | 8.60 | 12.85 | 31.34 | 9.83 | 7.40 | 31.42 |
| Parke | 7.90 | 10.88 | 14.72 | 37.13 | 12.85 | 9.37 | 37.99 |
| Pike | 8.07 | 11.29 | 15.39 | 44.35 | 13.33 | 9.84 | 45.38 |
| Posey | 11.01 | 14.91 | 21.30 | 40.47 | 17.26 | 12.58 | 41.16 |
| Putnam | 8.45 | 11.69 | 16.75 | 38.04 | 13.52 | 8.96 | 38.26 |
| Sullivan | 9.19 | 12.87 | 17.66 | 46.68 | 15.13 | 11.21 | 47.84 |
| Vanderburgh | 14.87 | 21.47 | 29.17 | 72.12 | 25.36 | 17.48 | 77.48 |
| Vermillion | 12.55 | 18.01 | 25.02 | 67.11 | 21.14 | 15.20 | 68.94 |
| Vigo | 10.37 | 15.15 | 20.66 | 56.46 | 17.96 | 13.07 | 58.71 |
| Total | 2.52 | 3.53 | 4.92 | 12.28 | 4.13 | 2.98 | 12.54 |
| Knobs Unit | | | | | | | |
| Brown | 3.02 | 6.85 | 11.65 | 23.60 | 8.35 | 19.72 | 25.25 |
| Clark | 3.76 | 8.91 | 14.77 | 36.58 | 10.88 | 25.57 | 38.87 |
| Crawford | 3.17 | 7.54 | 12.56 | 26.30 | 9.25 | 21.65 | 29.18 |
| Dubois | 3.59 | 8.49 | 14.26 | 34.83 | 10.29 | 24.18 | 36.53 |
| Floyd | 5.90 | 13.73 | 23.10 | 46.32 | 16.64 | 36.57 | 48.56 |
| Harrison | 3.01 | 7.13 | 11.64 | 30.75 | 8.81 | 20.99 | 32.93 |
| Jackson | 3.15 | 7.49 | 12.13 | 29.32 | 9.31 | 22.07 | 32.07 |
| Lawrence | 3.09 | 7.03 | 12.03 | 26.75 | 8.51 | 20.09 | 29.03 |
| Monroe | 3.20 | 7.36 | 12.30 | 19.94 | 8.98 | 21.47 | 21.98 |
| Morgan | 3.72 | 9.04 | 14.76 | 36.23 | 11.14 | 26.64 | 39.30 |
| Orange | 3.05 | 7.11 | 11.90 | 28.43 | 8.76 | 20.45 | 31.46 |
| Owen | 3.34 | 7.98 | 13.24 | 32.59 | 9.71 | 21.69 | 34.22 |
| Perry | 2.80 | 6.47 | 10.95 | 23.70 | 8.00 | 18.46 | 26.28 |
| Scott | 5.28 | 12.67 | 20.69 | 50.61 | 15.57 | 37.26 | 53.45 |
| Spencer | 4.38 | 10.67 | 17.40 | 42.81 | 13.08 | 31.55 | 45.81 |
| Warrick | 3.84 | 9.66 | 15.07 | 40.38 | 12.09 | 28.82 | 43.42 |
| Washington | 3.17 | 7.48 | 12.44 | 30.35 | 9.09 | 19.83 | 32.04 |
| Total | 0.83 | 1.95 | 3.24 | 7.26 | 2.39 | 5.58 | 7.87 |
| Upland Flats Unit | | | | | | | |
| Dearborn | 8.86 | 13.38 | 18.54 | 55.22 | 16.95 | 28.63 | 54.87 |
| Fayette | 14.62 | 24.73 | 32.24 | * ^{1/} | 32.61 | 51.41 | * |
| Franklin | 9.43 | 15.86 | 20.44 | 69.80 | 20.80 | 32.71 | 71.39 |
| Jefferson | 9.56 | 13.47 | 19.66 | 52.28 | 16.83 | 26.89 | 52.41 |
| Jennings | 9.04 | 13.68 | 18.85 | 54.85 | 17.32 | 28.96 | 54.95 |
| Ohio | 16.02 | 24.76 | 33.84 | * | 31.54 | 52.83 | * |
| Ripley | 9.72 | 14.27 | 20.45 | 53.03 | 17.83 | 28.43 | 53.82 |
| Switzerland | 9.76 | 13.10 | 19.81 | 47.80 | 15.92 | 27.36 | 47.20 |
| Union | 18.29 | 31.26 | 41.02 | * | 41.02 | 65.45 | * |
| Total | 3.54 | 5.32 | 7.45 | 21.06 | 6.71 | 11.01 | 21.13 |

(Table 39 continued on next page)

^{1/} * indicates a sampling error over 99.00 percent.

^{2/} Error figures are for average annual removals.

(Table 39 continued)

| Unit and county | Area | Growing stock | | | Sawtimber | | |
|-----------------|-------|---------------|--------|------------------------|-----------|--------|----------|
| | | Volume | Growth | Removals ^{2/} | Volume | Growth | Removals |
| Northern Unit | | | | | | | |
| Adams | 21.78 | 33.52 | 88.35 | 97.99 | 37.45 | * | * |
| Allen | 14.98 | 26.15 | 57.03 | 64.17 | 29.89 | 93.49 | 66.06 |
| Bartholomew | 12.22 | 18.57 | 53.20 | 53.96 | 20.59 | 80.92 | 54.59 |
| Benton | 66.77 | 97.55 | * | * | * | * | * |
| Blackford | 26.67 | 39.18 | * | * | 43.07 | * | * |
| Boone | 20.97 | 32.55 | 84.96 | 85.78 | 36.04 | * | 87.23 |
| Carroll | 19.06 | 29.60 | 75.87 | 83.35 | 33.03 | * | 84.91 |
| Cass | 16.62 | 26.55 | 68.63 | 87.75 | 30.20 | * | 91.19 |
| Clinton | 26.96 | 40.31 | * | * | 44.26 | * | * |
| Decatur | 16.66 | 24.55 | 71.15 | 67.00 | 27.04 | * | 67.94 |
| De Kalb | 15.65 | 25.07 | 64.78 | 88.02 | 28.67 | * | 91.80 |
| Delaware | 20.57 | 33.41 | 80.82 | 94.08 | 38.00 | * | 98.27 |
| Elkhart | 15.16 | 24.66 | 56.11 | 71.24 | 27.96 | 93.44 | 72.97 |
| Fountain | 13.52 | 21.08 | 56.43 | 71.98 | 23.89 | 84.76 | 74.10 |
| Fulton | 18.11 | 28.73 | 76.03 | 90.00 | 32.47 | * | 92.55 |
| Grant | 19.17 | 28.43 | 78.90 | 79.05 | 31.63 | * | 81.07 |
| Hamilton | 18.29 | 29.25 | 67.22 | 87.21 | 33.34 | * | 90.54 |
| Hancock | 23.81 | 37.99 | 95.59 | * | 43.44 | * | * |
| Hendricks | 19.44 | 30.99 | 83.79 | 87.75 | 34.54 | * | 89.52 |
| Henry | 18.02 | 28.54 | 74.28 | 83.82 | 32.13 | * | 86.54 |
| Howard | 27.88 | 47.91 | * | * | 54.14 | * | * |
| Huntington | 17.09 | 28.19 | 71.11 | 88.43 | 32.19 | * | 92.00 |
| Jasper | 15.74 | 25.45 | 61.10 | 73.21 | 28.73 | 99.00 | 75.01 |
| Jay | 16.69 | 24.47 | 75.50 | 69.90 | 26.86 | * | 70.46 |
| Johnson | 18.24 | 27.59 | 80.06 | 78.46 | 30.41 | * | 79.34 |
| Kosciusko | 14.24 | 20.97 | 63.66 | 59.82 | 23.07 | 96.49 | 60.40 |
| La Grange | 13.65 | 23.00 | 58.10 | 76.41 | 26.30 | 88.49 | 79.60 |
| Lake | 19.38 | 30.09 | 78.14 | 76.14 | 33.95 | * | 80.07 |
| La Porte | 12.71 | 20.43 | 48.50 | 57.89 | 23.04 | 79.20 | 59.22 |
| Madison | 22.68 | 34.06 | 97.00 | 89.00 | 37.80 | * | 91.83 |
| Marion | * | * | * | 72.98 | * | * | * |
| Marshall | 14.69 | 23.67 | 64.29 | 75.52 | 26.67 | 98.85 | 77.16 |
| Miami | 16.23 | 23.82 | 70.00 | 70.04 | 26.34 | * | 70.94 |
| Montgomery | 16.69 | 26.65 | 63.63 | 81.44 | 30.51 | 97.74 | 85.08 |
| Newton | 19.33 | 28.53 | 78.14 | 88.30 | 32.03 | * | 91.16 |
| Noble | 14.39 | 23.45 | 57.58 | 71.98 | 26.73 | 88.83 | 74.37 |
| Porter | 14.78 | 24.14 | 56.83 | 72.28 | 27.66 | 87.19 | 76.08 |
| Pulaski | 15.74 | 25.00 | 62.24 | 77.98 | 28.32 | 97.83 | 79.98 |
| Randolph | 18.42 | 27.05 | 78.78 | 71.17 | 29.72 | * | 72.42 |
| Rush | 23.22 | 40.67 | 90.34 | * | 46.38 | * | * |
| St. Joseph | 17.24 | 28.34 | 64.29 | 76.68 | 32.35 | * | 79.87 |
| Shelby | 23.13 | 34.10 | * | 99.34 | 37.72 | * | * |
| Starke | 15.77 | 24.76 | 62.53 | 75.96 | 27.85 | 98.62 | 77.28 |
| Steuben | 14.57 | 23.96 | 58.00 | 74.42 | 27.37 | 89.87 | 76.84 |
| Tippecanoe | 17.20 | 27.92 | 66.57 | 86.03 | 32.05 | * | 90.38 |
| Tipton | 37.72 | 66.21 | * | * | 75.43 | * | * |
| Wabash | 16.69 | 27.28 | 65.69 | 85.15 | 31.20 | * | 89.39 |
| Warren | 16.76 | 26.11 | 68.91 | 77.41 | 29.20 | * | 78.65 |
| Wayne | 14.48 | 23.35 | 61.74 | 72.36 | 26.45 | 93.45 | 74.49 |
| Wells | 20.32 | 32.12 | 79.20 | 96.87 | 36.61 | * | * |
| White | 22.68 | 38.52 | 89.81 | * | 44.42 | * | * |
| Whitley | 18.06 | 29.26 | 76.57 | 98.56 | 33.29 | * | * |
| Total | 2.44 | 3.88 | 9.96 | 11.23 | 4.37 | 15.47 | 11.56 |
| All counties | 1.00 | 1.57 | 3.42 | 5.40 | 1.86 | 5.47 | 5.68 |

^{1/} * indicates a sampling error over 99.00 percent.^{2/} Error figures are for average annual removals.

Spencer, John S., Jr.; Kingsley, Neal P.; Mayer, Robert W.

1990. **Indiana's timber resource, 1986: An analysis.** Resour. Bull. NC-113. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 85 p.

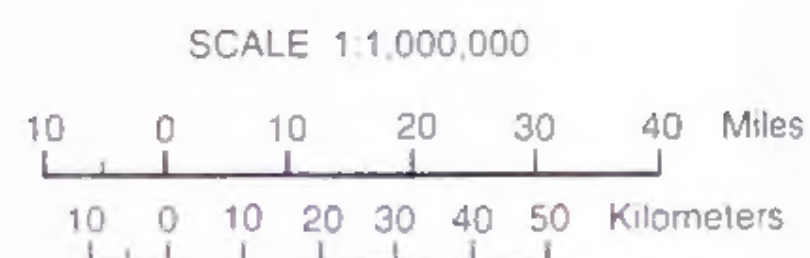
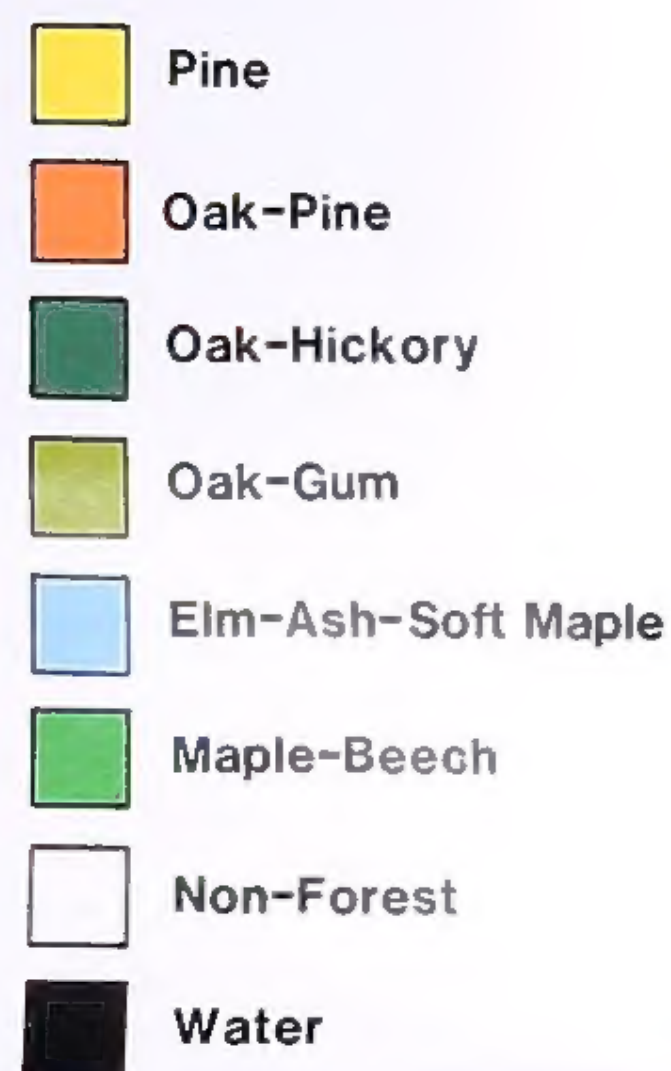
The third inventory of Indiana's timber resource shows that area of timberland increased from 3.9 to 4.3 million acres between 1967 and 1986, and growing-stock volume gained from 3.7 to 5.2 billion cubic feet. Presented are analysis and statistics on forest area and timber volume, growth, mortality, removals, and projections.

KEY WORDS: Forest statistics, area, volume, growth, mortality, removals.

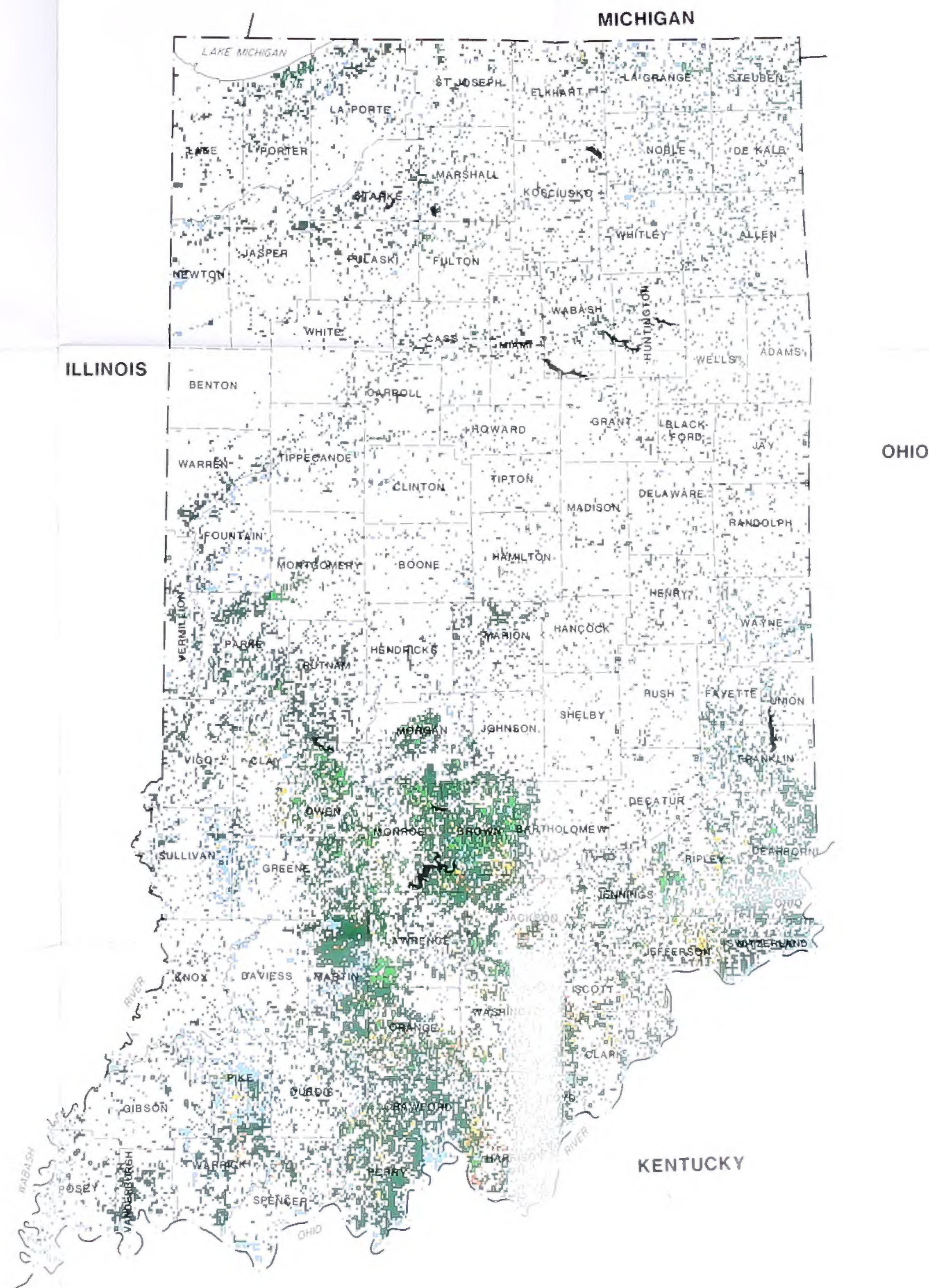
INDIANA

Major Forest Types

1986



Compilation Procedure
 Forest types were interpreted on the most recent available aerial photography for each county in Indiana at 1:40,000 and 1:50,000 scale, using standard forest inventory procedures and plotted on a 1:1,000,000 scale map.
 Compiled by: Ronald L. Wickett, Thomas Castonguay, Brad Smith, and Patrick Miles.
 Prepared by: Martine Corporation



Our job at the North Central Forest Experiment Station is creating, evaluating, and disseminating information and technology to improve management and use of our natural resources.

As a new generation of forests emerges in our region, managers are confronted with two unique challenges: (1) Dealing with the great diversity in composition, quality, and ownership of the forests, and (2) Reconciling the conflicting demands of the people who use them. Helping the forest manager meet these challenges while protecting the environment is what research at North Central is all about.

